FLOOD PLAIN MANAGEMENT STUDY

CRAWFORD COUNTY, INDIANA

JULY 1984

24500

FLOOD PLAIN MANAGEMENT STUDY

CRAWFORD COUNTY, INDIANA

Prepared by:

United States Department of Agriculture
Soil Conservation Service
Indianapolis, Indiana

Assisting the:

Crawford County Soil and Water Conservation District ... [et al.];
Crawford County Commissioners
Town of English
Town of Milltown
Town of Marengo

In cooperation
with the
Indiana Department of Natural Resources.

July 1984

FOREWORD

The technical information in this flood plain management study report was prepared by the Soil Conservation Service, U.S. Department of Agriculture (USDA). The report is intended to serve as a technical base from which local flood plain management decisions can be made. The State and local units of government, as well as the general public, will benefit from the increased knowledge concerning flood hazards in Crawford County. Local units of government can obtain assistance in selection and implementation of a flood plain management program from the Indiana Department of Natural Resources (IDNR).

The study was made possible through helpful cooperation and assistance among local, state, and federal agencies. Particular assistance is acknowledged from: the Crawford County Soil and Water Conservation District for calling attention to particular flood problems and for promotion of the study, the Crawford County Commissioners, the English Town Board, the Milltown Board, and the Marengo Town Board for joining with the Soil and Water Conservation District in requesting the study, the Geological Survey of the U.S. Department of Interior for maps and stream flow records and the Division of Water, Department of Natural Resources, State of Indiana, for stream mileage data and other technical assistance, and a complete flood report for the town of Marengo.

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CRAWFORD COUNTY FLOOD PLAIN MANAGEMENT STUDY

INTRODUCTION

This report presents the results of the flood plain management study conducted in select areas of Crawford County. The study was conducted by the U.S. Dept. of Agriculture, Soil Conservation Service (SCS) in accordance with Federal Level Recommendation 3 of "A Unified National Program for Flood Plain Management," and Section 6 of Public Law 83-566., Watershed Protection and Flood Prevention Act.

Topographic surveys for the study were made by Abrams Aerial Survey Corporation under contract with SCS.

The Indiana Department of Natural Resources (IDNR) assisted in overall leadership and coordination of the study, and provided the aerial photography and other data. The IDNR will continue to assist the local sponsors in implementation of flood plain management alternatives.

Floodway information for the areas covered by this study are published separately as an Addendum to this report.

Flood information for the Town of Marengo can be found in a report entitled Floods, Problems and Solutions, Marengo, Indiana prepared by the State of Indiana, Department of Natural Resources, Division of Water, 1980.

STUDY AREA

Crawford County is in the extreme south-central part of Indiana. It encompasses an area of 199,680 acres. The county population is 9,699. English, the county seat, has a population of 523. Other small communities in the county, for which 1980 census are available, are Milltown, population 604 and Marengo, population 885.

Crawford County is located in the Crawford Upland physiographic province. The area is characterized by a maturely dissected plateau with abundant stream valleys and a well integrated stream system. Most of the area has high sloping topography with narrow flat topped drainage divides and steep valley walls. The larger valley bottoms have moderately wide flood plains. Overall topographic relief is generally between 300 to 350 feet.

Crawford County has a history of substantial and persistent unemployment. In February 1981, Crawford County unemployment rates were 20.5% compared to a statewide rate of 9.9%. In January 1981, the rate was 19.2% compared to a state rate of 9.5%. The 1980 average unemployment for the county was 15.2% compared to the statewide rate of 9.6%.

All streams studied are in hydrologic unit 05140104 (see Index maps, Appendix A). The studied streams are as follows:

Stream Name	Approximate Drainage Area (Sq. Mi.)	Approximate Length (miles) Detailed	Limited
Brownstown Creek	6.85	1.3	1.1
Bird Hollow Creek	9.95	1.4	1.2
Dog Creek	5.82	0.5	1.8
Camp Fork Creek	9.90	2.4	0
Little Blue River 1/	54.6	3.4	5.8
Otter Creek	18.9	2.0	2.7
Stinking Fork 2/	12.86 3/	2.0	0
Potts Creek	3.61	0.5	0
Blue River 4/	398.0	2.0	0
Total	-	15.5	12.6 miles

The stream segments that lie in or near the towns were studied in detail and the flood hazard area determined using 2-foot contour topographic maps. The remaining study areas were analyzed with less intensity. These areas are referred to as limited study or limited detail. In the limited study segments, the flood hazard area was determined from USGS topographic quadrangle and surveyed cross-sections.

Whiskey Run and Brandywine Fork flooding in the town of Marengo were studied separately by the Indiana Department of Natural Resources. The results of that study are published in a report "Floods, Problems and Solutions, Marengo Indiana;" State of Indiana Department of Natural Resources Division of Water, 1980.

NATURAL VALUES

Crawford County has 21,900 acres of prime farmland. However, very little prime farmland exists in the flood hazard area because of frequent flooding.

Most of the county is forested or is used for permanent pasture. A small part, mainly on bottomlands, terraces, and narrow ridgetops, is used for cultivated crops. Most farms in the county are general farms. Livestock and livestock products are the major sources of farm income.

The Crawford County Flood Plain Management Study (CCFPMS) area is within Indiana's south-central limestone, sandstone and shale region. This region is characterized by such natural features as sinkholes, caves, underground streams, steep escarpments, and deep, sheltered ravines. Cave fishes of the family Amblyopsidae, Indiana's only protected fish, may occur in these areas. These physical features combine with unique plants and animals to provide many areas of natural beauty.

1/ English downstream to State Rd. 37
2/ Approximately 1 mile N and S of the Town of West Fork
3/ Including Potts Creek
4/ Approximately 1 mile N and S of the Town of Milltown

Blue River, at the east boundary of the county, is one of the most scenic streams in Indiana and has been given some consideration for possible inclusion in the National Wild and Scenic Rivers System. However, it is not truly a wild or untouched stream. It bears many scars and relics of man.[5/] The Blue River does provide a high potential for recreational use.

There is a concentration of natural areas in Union Township. Eight specific "natural areas" and six additional "plant sites" occur in the Otter Creek, Stinking Fork, and Potts Creek watersheds. These areas include several rare species of plants. Four potential "glade" natural areas also occur in Union Township. Hemlock Cliffs, the largest natural area in the CCFPMS area, is in the Otter Creek watershed.

An additional four rare "plant sites" and six potential natural areas (glades) are scattered throughout the remainder of the CCFPMS area. One plant site occurs in each of the following watersheds: Bird Hollow Creek, Camp Fork Creek, and Devil's Hollow (Blue River). The remaining plant site is upland (southeast of Taswell). Four potential natural areas (glades) are in the Brownstown Creek, Camp Fork Creek, and Brushy Creek-Bogard Creek watersheds; the other two areas are upland.

FLOOD PROBLEMS

Flooding in the town of Milltown along Blue River is generally the result of long duration (one or more days) high volume rainfalls. Approximately 35 structures, including homes, stores, and other small businesses, are flooded by the 100-year flood event. The flood plain in the Blue River Study Area is 191 acres of which 139 acres are in the town of Milltown. Record high floods on Blue River occurred on January 22, 1959, when 6.3 inches of rain fell on frozen ground over an 8-day period, and on March 10, 1964, when 12.1 inches of rainfall occurred over a 9-day period. These rainfall data were recorded at Palmyra, Indiana.

Floods on Little Blue River generally resulted from intense bursts of rainfall. The town of English is in the flood plain of Little Blue River near the junctions of four tributaries, Camp Fork, Dog Creek, Bird Hollow, and Brownstown Creek. The four tributaries are comprised of similar drainage areas consisting of steep topography. The peak flow from each of these tributaries reach Little Blue River almost simultaneously, causing extensive flash flooding in English. In the study area, the flood plain of Little Blue River is 592 acres; Camp Fork Creek, 141 acres; Bird Hollow Creek, 97 acres; and Brownstown Creek 62 acres. Approximately 80 houses and 20 business and commercial buildings are in the 100-year flood plain on Little Blue River and its tributaries in the vicinity of English.

In the past 50 years, English has experienced flood water in the business area six times (1937, 1958, 1959, 1964, and twice in 1979). The July 1979 flood was the most severe with an estimated damage of $3,000,000. The other floods were serious but actual damages were much less than the July 1979 flood. The average annual damages are estimated at $40,000.

5/ Information on natural areas in the CCFPMS was gathered from <u>Natural Areas in Indiana and Their Preservation</u> (1969, Lindsey, Schmelz, and Nichols) and staffs of the U.S. Forest Service (USDA), Division of Nature Preserves (IDNR), and Division of Outdoor Recreation (IDNR).

Flooding along Otter Creek also is generally the result of intense rainfall on steep topography and the flow of several tributaries combining simultaneously. Eight houses along Otter Creek are within the 100-year flood plain. In the study area of Otter Creek, the flood plain is 342 acres.

Flooding of Stinking Fork results from high intensity rainfalls on the steep wooded watershed. There are two houses in the Stinking Fork and Potts Creek 100-year flood plain. Most of the improvements in the town of West Fork are located above the flood plain of Stinking Fork. There are 130 acres of flood plain in the study area of Stinking Fork. The total flood plain in the study areas for Little Blue River and its tributaries, Otter Creek, Stinking Fork, Camp Fork, Brownstown Creek and Bird Hollow, is 1364 acres. The maximum average annual damage to crop and pasture on these areas is estimated to be $12,000.

The towns of English, Mifflin, West Fork and Marengo experienced record high floods in June 1979 and then again in July 1979. The June flood was the result of 6.85 inches rainfall in two days recorded at English[6/]. The July flood was from 7.05 inches rainfall in two days recorded at English. However, there are local reports of 6 to 10 inches of rainfall in a period of a few hours. One report indicated 10 inches rainfall in four hours. On July 26, 1979, a flow measurement of 22,500 cfs was recorded downstream of English on Little Blue River. This is much greater than the 100 year frequency inter-agency coordinated discharge of 13,000 cfs. used for this study.

Flood damages by community are summarized as follows:

TOWN Stream	AREA FLOODED ACRES	NUMBER HOUSES	NUMBER COMMERCIAL BUILDINGS	AVE ANNUAL URBAN $ DAMAGE	AVE ANNUAL AGRICULATURAL $ DAMAGE
Milltown		30	5	*	
Blue River	191				*
English		80	20	40,000	
Camp Fork	141				1,300
Brownstown	62				500
Bird Hollow	97				600
Little Blue R.	592				5,200
Miflin		8	0	*	
Otter Ck.	342				3,100
West Fork		2	0	*	
Stinking Fork	130				1,300
TOTAL	1555	120	25	40,000	12,000

* Not Evaluated

6/ Climatological Data, National Oceanic and Atmospheric Administration, Department of Commerce.

The flooding problems in Marengo are addressed in a separate study completed by Indiana Department of Natural Resources in 1980.

EXISTING FLOOD PLAIN MANAGEMENT

After a record high flood in January 1959, the U.S. Army, Corps of Engineers, prepared plans for a local flood control project at English consisting of 3.4 miles of channel enlargement on Little Blue River. This channel improvement was completed November 1964. The local community has the responsibility for maintenance of this project, but has been unsuccessful in accomplishing much debris removal until after two disastrous floods in June and July of 1979.

Crawford County has a Flood Plain Commission with ordinances controlling building in the flood plain. Crawford County unincorporated, Town of English, Town of Marengo, and Town of Milltown are all participating in the National Flood Insurance Program. The town of Marengo is in the regular phase of the program and the other areas are in the emergency phase of the Flood Insurance Program.

After the July 1979 flood, about a dozen houses were removed from the flood plain rather than repaired, thus reducing the potential for future flood damages. Also, maintenance was performed on Little Blue River, therefore, increasing its capacity to remove flood waters.

ALTERNATIVES FOR FLOOD PLAIN MANAGEMENT

1. Non Structural Alternative

   The following are types of non structural measures that are designed to reduce flood damages to existing structures in the flood plain, and reduce potential damages to future development.

   a. Flood plain regulations and ordinances
      Update existing flood plain ordinance by incorporating the flood plain, and profile information of this report, the floodway shown in the addendum and the report entitled Floods, Problems and Solutions, Marengo, Indiana by State of Indiana, Department of Natural Resources, Division of Water, 1980. These reports will provide much improved information in depth and areas flooded.

   b. Floodproof existing structures
      Floodproofing the existing structures in the flood plain consist of three types. The first type is Dry Floodproofing. Dry floodproofing is designed to keep floodwaters out of the structure. The second type is Wet Floodproofing and is designed to minimize the damage once the floodwaters enters the structure. The third type is elevated structures designed to raise structures above the base flood (100-year) elevation.

      (1) Dry Floodproofing: This type of floodproofing is designed to keep the flood waters out of the structures. To prevent inundation, floors and walls must be reinforced and sealed. All doors, windows and other openings must be reinforced and fitted with

emergency closures. Evidence suggests that because of water pressure, it is impractical to dry floodproof most structures higher than 2 to 3 feet. Satisfactory results with dry floodproofing are often difficult to obtain because of the potential for small leaks to develop along doors and in foundations. These small leaks may become serious, especially when flooding is of long duration.

However this type of floodproofing can be effective in reducing the types of damages caused by minor floods such as the June 1979 floods in English and Marengo.

(2) Wet Floodproofing: This type of floodproofing is designed to minimize the damage once floodwater has entered the structure. This method intentionally allows floodwater to enter basements or first floors or uses fresh water to flood these areas to counteract floodwater pressure and prevent the intrusion of sediment-laden floodwaters. Wet floodproofing is designed mainly to protect the structural integrity of a building by permitting damage to electrical systems, building contents and interior walls. Measures should be taken to permit rapid removal or floodproofing of machinery, materials, and other damageable contents.

Floodproofing of damageable contents may be accomplished using several different methods. Examples of some of these methods are as follows:

- -Place watertight seal on vault doors
- -Place office and business machines on stands off the floor
- -Build protective floodwalls around critical machines that cannot be raised.
- -Use damage resistent material on floors, walls, etc.
- -Place movable stock on carts, pallets to facilitate removal time
- -Place electrical outlets above flood levels.
- -Place flood prone stock above flood levels

These types of measures can minimize flood damages. However, it is practically impossible to provide total protection from floods of the magnitude of the July 1979 event.

(3) Floodproofing by Elevated Structures: This type of floodproofing is designed to raise the structure above the base (100 year) flood. This is accomplished by raising the structure on either post or pier, or on fill and foundation. This is the most positive method of floodproofing a structure. Even if the base flood is exceeded, often only minor flooding occurs in the structure, causing limited damages.

Despite its advantages in low velocity inland areas, fill can destroy wetlands and reduce flood storage capacity. It also is subject to erosion in high velocity flow areas and creates a mound effect, which, even with skillful landscaping may be aesthetically unattractive.

2. Channel Maintenance Alternative

Little Blue River near English was enlarged in 1964 to provide local flood protection for English. In order to retain the planned flood reduction, channel maintenance is required. A maintenance program consisting of annual removal of gravel bars and vegetation would reduce flood levels in English by 1.5 to 2.0 feet from the levels expected with the channel in its present condition. Without maintenance, vegetation and gravel bars will continue to reduce channel capacity and flooding will increase.

3. Structural Alternative

The installation of the structures shown in Appendix A would significantly reduce flooding in English, Mifflin and West Fork.

a. English - Little Blue River
If all 5 structures shown upstream of English were installed, the depth of flooding in English could be reduced approximately five feet for the frequencies studied. If the channel maintenance were performed the flood depth could be reduced another 1½ feet.

This reduction in flood depth would eliminate most of the flood damages. However, an economic evaluation would show that the structures do not have a favorable benefit-cost ratio. The average annual urban damage at English is estimated at $40,000 and the average annual agricultural damages on Little Blue River and Camp Fork are estimated to be $6,000. In order to have an economically justified project to eliminate these damages the installation costs would have to be less than $566,000. This is based on the presently required interest rate of 8 1/8% and not accounting for costs of operation and maintenance.

b. Town of West Fork - Stinking Fork
The installation of two structures upstream of the town of West Fork would reduce flooding along Stinking Fork by about five feet to the junction of Potts Creek and about two feet downstream of Potts Creek. Since the average annual damage to the town of West Fork is small, the studied structures would not be economically justified.

c. Town of Mifflin - Otter Creek
The installation of the 3 structures upstream of the Town of Mifflin would virtually eliminate flooding of Otter Creek in the vicinity of Mifflin. Average annual damages at Mifflin are not sufficient to economically justify these structures.

d. Town of Milltown - Blue River
Flood retarding structures are not considered practical for flood reduction at Milltown. Flood protection for most of the existing urban development might be obtained by use of an existing railroad grade as a levee and extending it to the west of the south edge of town. Local citizens report reduced flood damages

in town after openings in the old railroad grade were filled. However, there still is an opening at the south edge of town, allowing water to back into town. The determination of engineering practicability of extending and using this railroad grade as a levee is beyond the scope of the study.

STRUCTURE LOCATION

The studied structures were located to minimize disruption of transportation routes, public utilities and homes. Ideally, Structure #1 would be much more effective if located on Camp Fork, however, because of disruption of the Southern Railroad and old highway, it was located on a tributary to Camp Fork.

Structure Sites 3 and 4 would inundate State Highway 37. These sites were studied with the anticipation that Highway 37 may sometime be relocated. It is presumed that Site 4 would be installed in lieu of the combination of Sites 2 and 3. Site 2 and 3 were studied to show the effect of control on Dog Creek or control on Bird Hollow Creek. A structure on Brownstown Creek would be more effective than Sites 5 and 6 located on tributaries to Brownstown Creek. However, any structure on Brownstown Creek would require the relocation of the county road and a modification to the main water supply line to English.

Structures 10 and 11 upstream from West Fork would require road closings or relocation, as would Structures 7, 8, and 9 upstream from Mifflin.

STRUCTURE EVALUATION

The effects of the structures are shown in terms of reduction of discharges and elevations in Appendix F. The effect on the 100 year frequency profile is shown in Appendix D. A general cost estimate is shown in Appendix E. A more detailed analysis of each structure may change the estimated costs substantially. A general economic analysis shows that costs would clearly exceed expected benefits and a more detailed analysis is not warranted.

FLOOD HAZARD MAPS

The flood hazard maps shown in Appendix B show area inundated by the one percent chance or 100-year frequency flood. The discharges used for all study areas, except Blue River, were determined with the use of the SCS TR-20 computer hydrology model. The 24-hour rainfalls published in the Weather Bureau TP-40 were used. The TR-20 generated discharges were plotted with the corresponding drainage areas on semi-log paper and the best fit straight line determined. These discharges were then coordinated with the various water resource agencies by the Indiana Department of Natural Resources (IDNR). The Blue River discharges were determined from the White Cloud and Fredericksburg stream gage records and coordinated with the water resources agencies by IDNR.

Flood elevations were determined with the aid of the SCS-WSP2 water surface profile program. The flood hazard areas were then determined by drawing the WSP2 flood elevations on 2 foot contour maps for the areas studied in detail.

The flood hazard areas were outlined on USGS 10 foot contour topographic maps in areas designated as limited detail study area. The flood hazard areas were than transposed to the photomosaics (Appendix B).

The 500 year frequency flood will extend from 10 to 50 feet beyond the 100 year frequency flood shown as the flood hazard area on the maps. The profiles (Appendix C) show the difference in elevation of the 500 and 100 year frequency floods.

FLOODWAY

Floodway maps for the study areas are published separately as an addendum. Under the floodway concept the 100-year flood hazard area is divided into a floodway and a floodway fringe. The floodway is the channel of the stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood may be carried without substantial increase in flood heights. The Indiana Department of Natural Resources generally recommends the increase in stage be limited to 0.1 foot. The floodways for this study were therefore based on 0.1 foot increase in stage. The floodways were computed on the basis of equal conveyance reductions from each side of the flood plain. The floodway widths were determined at each cross-section. Between cross-sections the boundaries were interpolated.

On Camp Fork Creek, the floodway was shifted to the left the distance of the left flood plain fringe. This was done because the left flood plain fringe was a narrow strip between the railroad track and the floodway and could not have been utilized.

In cases where the boundaries of the floodway and the 100-year flood plain are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood plain is the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water surface elevation of the 100-year flood more than 0.1 foot at any point.

CONCLUSIONS AND RECOMMENDATIONS

Non-structural alternatives will minimize future flood plain losses with a minimum of investment.

1. Flood plain ordinances based on the technical information from this study will reduce risk of future flood losses by proper planning of floodplain development.

2. Floodproofing of existing structures reduces flood losses at a minimum of cost. The examples listed for floodproofing should be well publicized so that the floodplain occupants are aware of what they can do to protect their property.

3. Implementation of a flood warning system could reduce loss by providing time to install some of the listed floodproofing items.

Structural alternatives could reduce flood losses on existing property as well as future developments. The cost of structural alternatives is very great and exceeds the expected benefits. Financing and land rights would be major problems with structural alternatives.

ASSISTANCE

The Indiana Department of Natural Resources (IDNR) will assist the local sponsors in developing flood plain regulations and coordinate the National Flood Insurance Program. The IDNR will also assist in the implementation of any other alternatives that will reduce losses from floods.

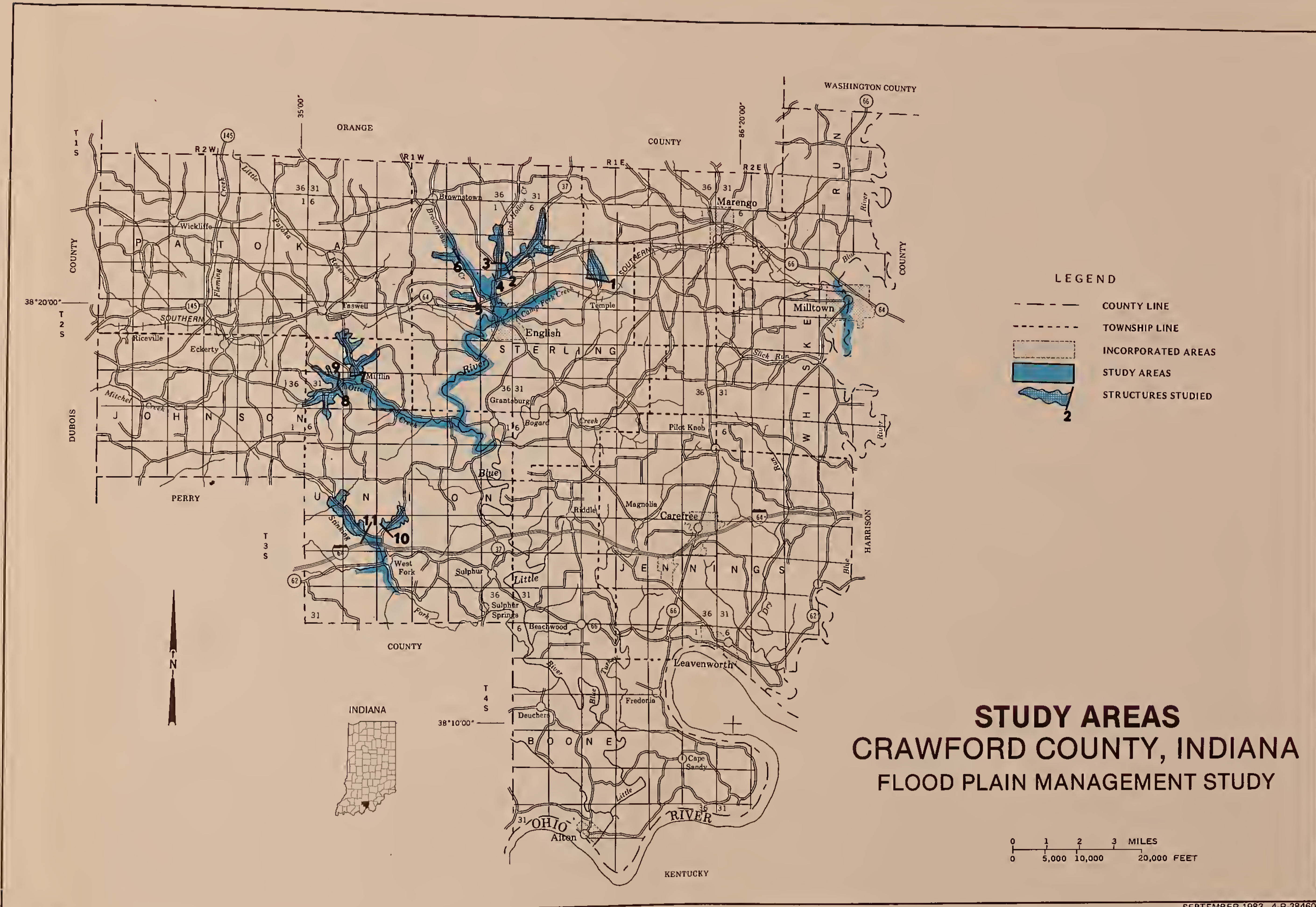
Indiana Regional Planning Commission will also assist in the development of ordinances, plans and help arrange for any available financial assistance.

The Soil Conservation Service will assist in interpreting the findings of this study.

APPENDIX A

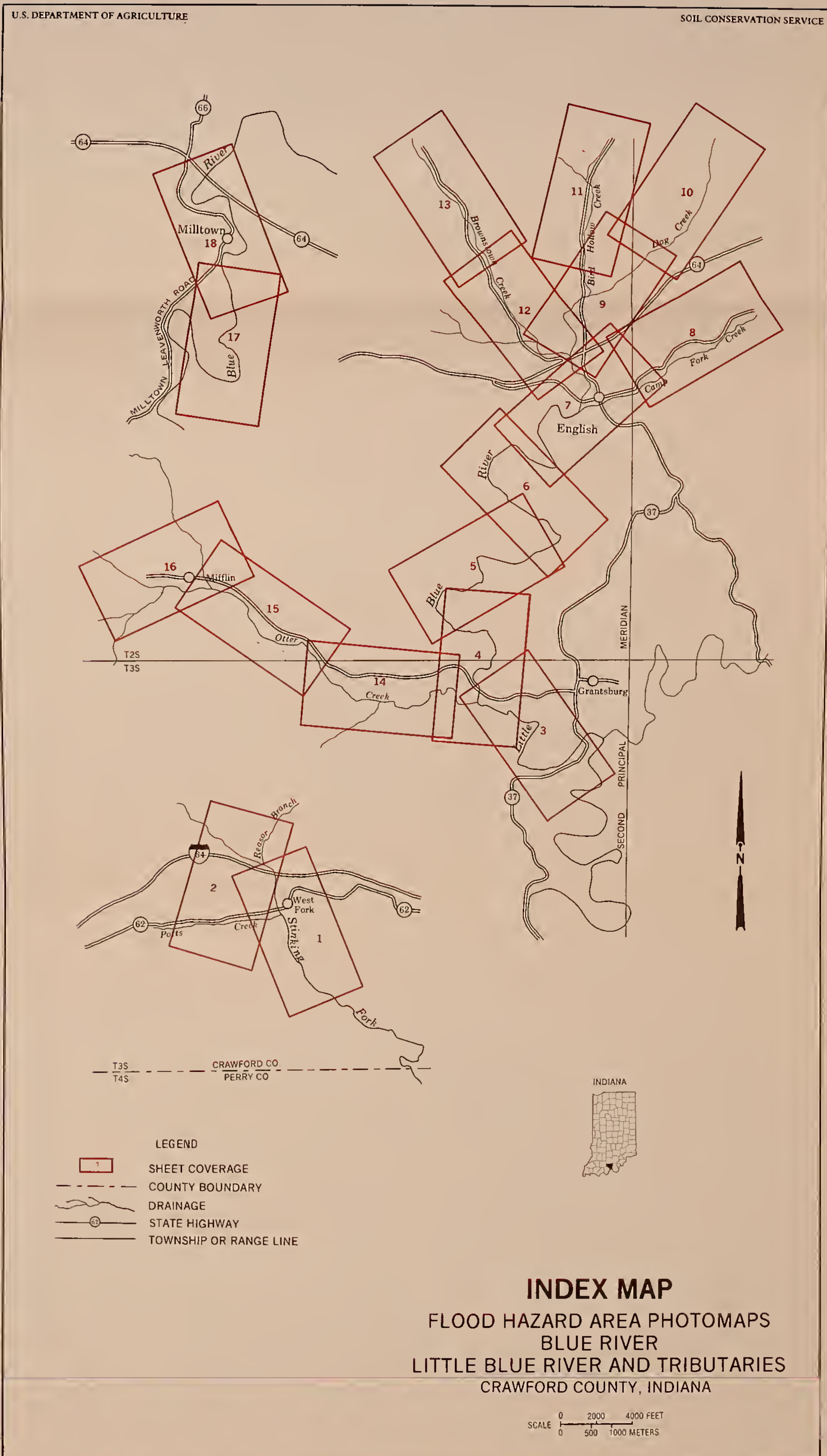
Study Area Map

Index to Flood Hazard Area Photomaps



STUDY AREAS
CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

SEPTEMBER 1983 4-R-38460



INDEX MAP

FLOOD HAZARD AREA PHOTOMAPS
BLUE RIVER
LITTLE BLUE RIVER AND TRIBUTARIES
CRAWFORD COUNTY, INDIANA

SEPTEMBER 1983 4-R-38460

APPENDIX B

Flood Hazard Area Photomaps

LEGEND

100 Year Flood Hazard Area	X BM	Bench Marks	
		Cross Section Location	

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

SEPTEMBER 1983 4-R-38460

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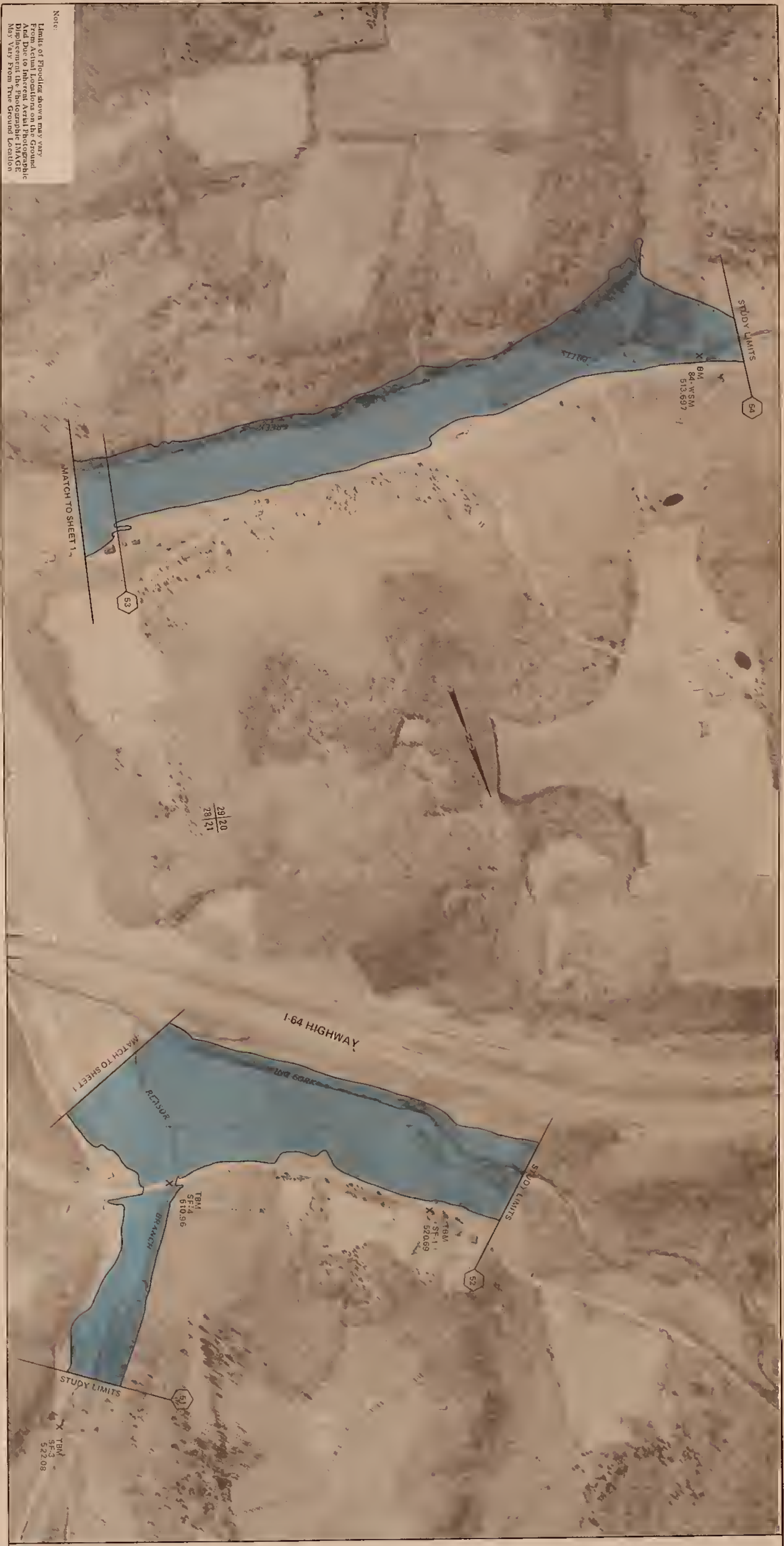
U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Stinking Fork



LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

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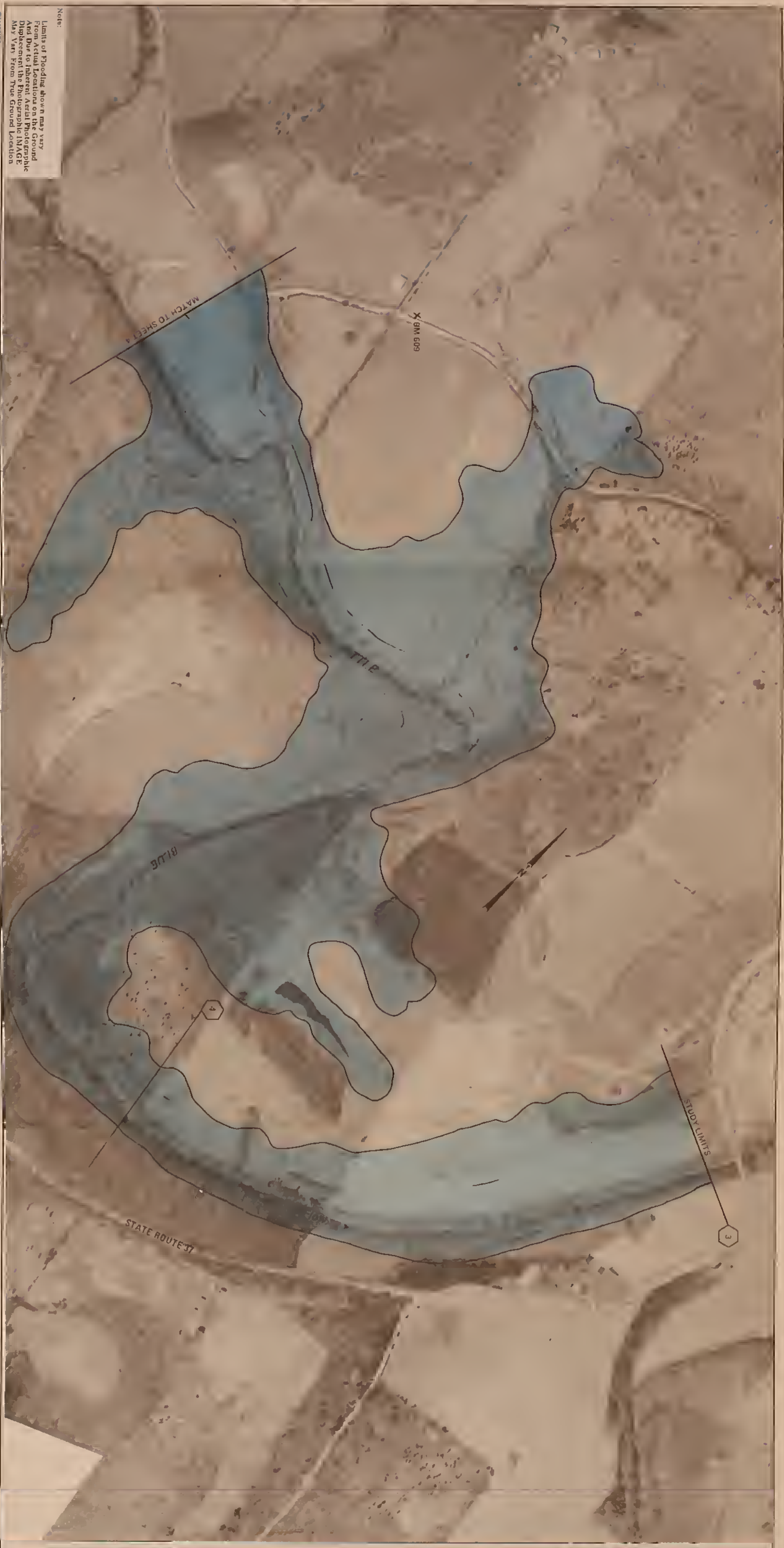
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Stinking Fork And Potts Creek, Town of West Fork



LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET

0 100 200 METERS

APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

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CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Little Blue River

SHEET 3 OF 18

SEPTEMBER 1983 4-R-38460

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

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FLOOD HAZARD AREA

Little Blue River

SHEET 4 OF 18

SEPTEMBER 1983 4-R-38480

LEGEND

100 Year Flood Hazard Area

× BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

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FLOOD HAZARD AREA

Little Blue River

SHEET 5 OF 18

SEPTEMBER 1983 4-R-38460

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

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FLOOD HAZARD AREA

Little Blue River

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

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FLOOD HAZARD AREA

Little Blue River And Camp Fork Creek

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET

0 100 200 METERS

APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

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U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Camp Fork Creek

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET

0 100 200 METERS

APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

U S DEPARTMENT OF AGRICULTURE
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FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Bird Hollow and Dog Creek to Hwy-64

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SEPTEMBER 1983 4-R-38460

Note:
Limits of Flooding shown may vary From Actual Locations on the Ground And Due to Inherent Aerial Photographic Displacement the Photographic IMAGE May Vary From True Ground Location

LEGEND

100 Year Flood Hazard Area

× BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Dog Creek

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SEPTEMBER 1983 4-R-38460

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Bird Hollow Creek

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SEPTEMBER 1983 4-R-38480

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Brownstown Creek

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

SEPTEMBER 1983 4-R-38460

SHEET 13 OF 18

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Brownstown Creek

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

SEPTEMBER 1983 4-R-38480

SHEET 14 OF 18

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Otter Creek

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Otter Creek

SEPTEMBER 1983 4-R-38460

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Otter Creek , Trib.#1 and Trib.#2

SEPTEMBER 1983 4-R-38460

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

SEPTEMBER 1983 4-R-38480

SHEET 17 OF 18

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Blue River , Milltown Area

LEGEND

100 Year Flood Hazard Area

X BM Bench Marks

Cross Section Location

SCALE 0 400 800 FEET
0 100 200 METERS
APPROXIMATE

Using the Latest Aerial Photo Coverage 1981

SEPTEMBER 1983 4-R-38460

SHEET 18 OF 18

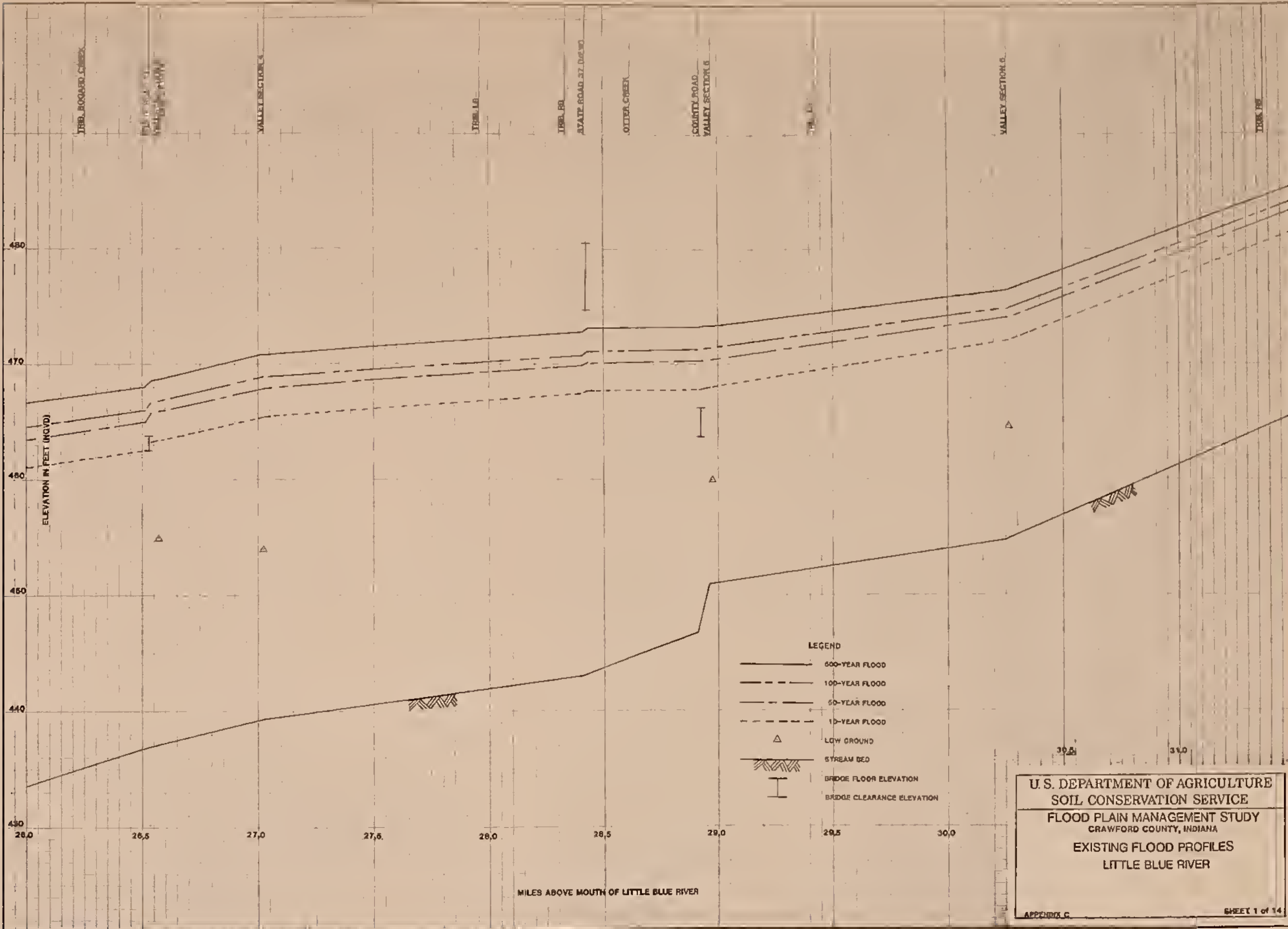
U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CRAWFORD COUNTY, INDIANA
FLOOD PLAIN MANAGEMENT STUDY

FLOOD HAZARD AREA

Blue River , Milltown Area

APPENDIX C

Existing Flood Profiles



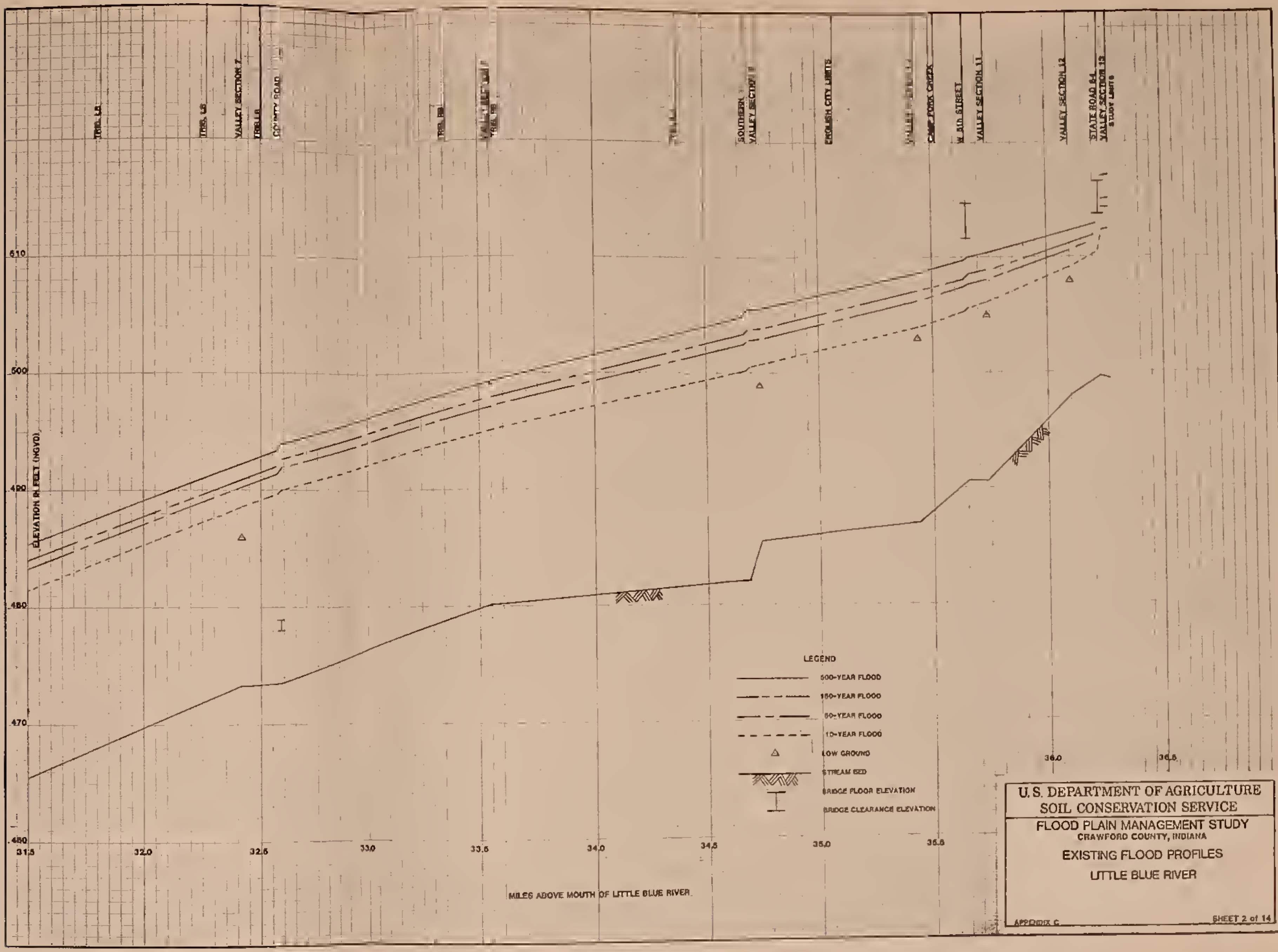
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA

EXISTING FLOOD PROFILES
LITTLE BLUE RIVER

APPENDIX C

SHEET 1 of 14



U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA

EXISTING FLOOD PROFILES
LITTLE BLUE RIVER

APPENDIX C

SHEET 2 of 14

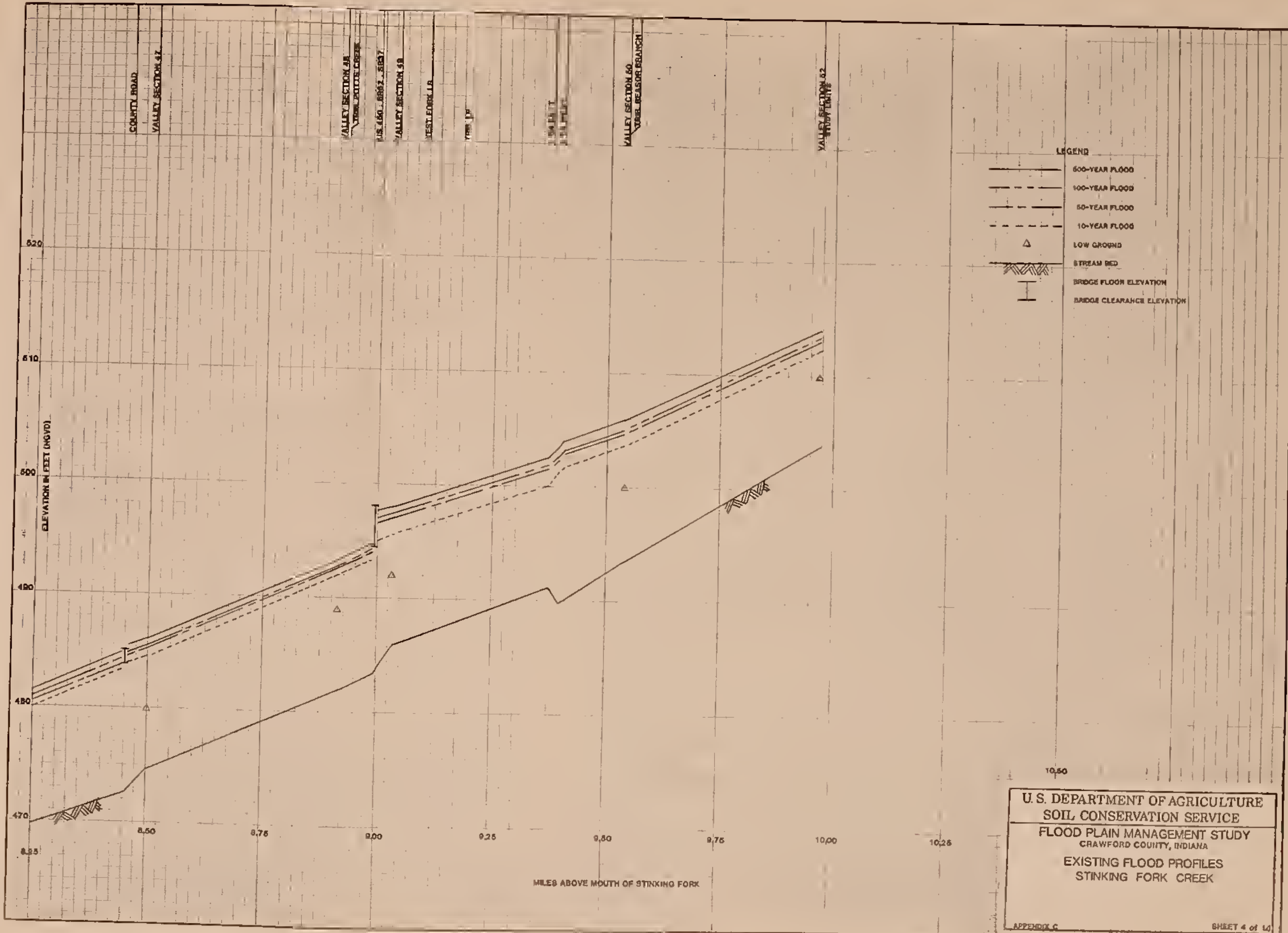
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA

EXISTING FLOOD PROFILES
STINKING FORK CREEK

APPENDIX C

SHEET 3 of 14



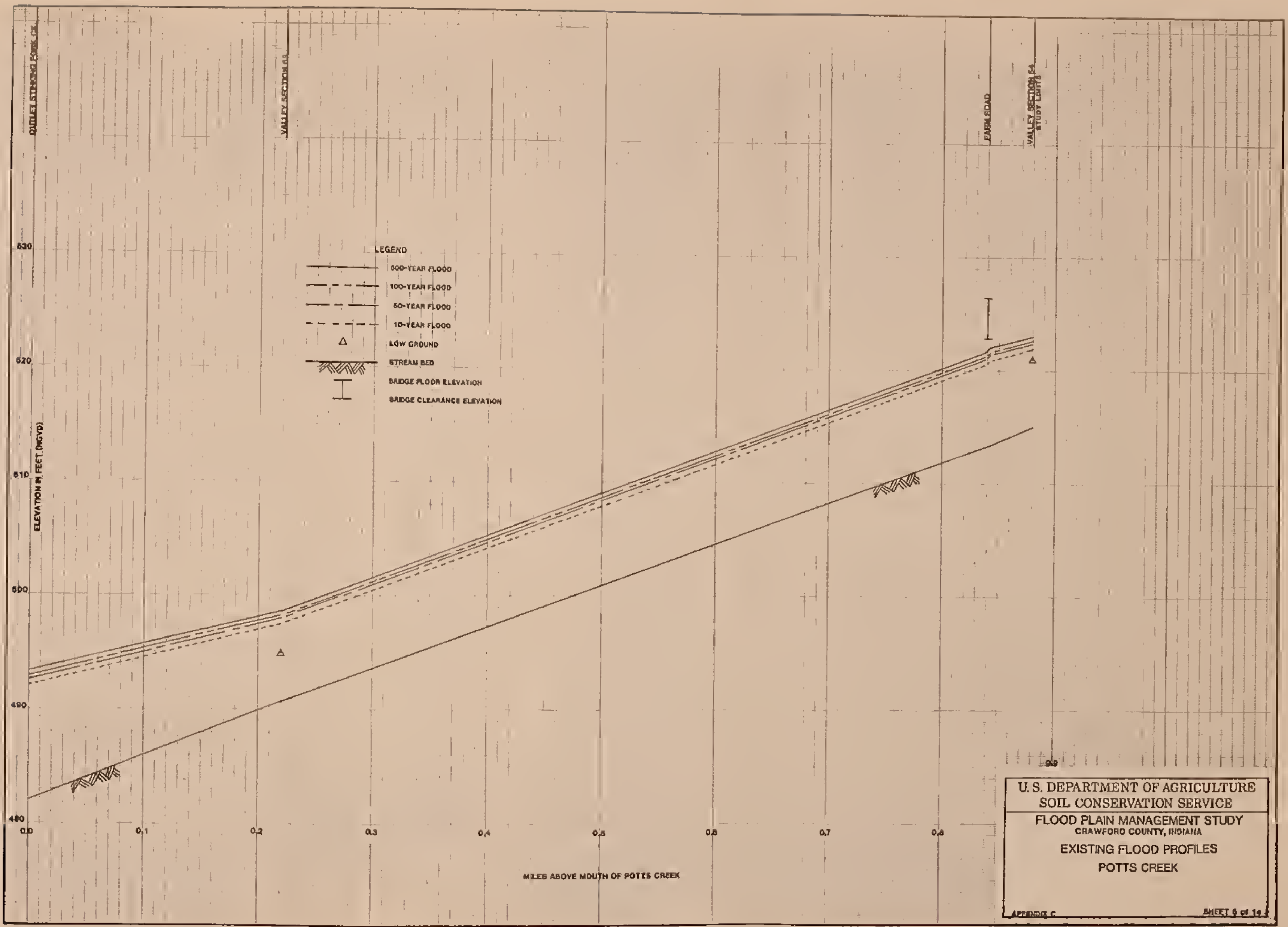
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA

EXISTING FLOOD PROFILES
STINKING FORK CREEK

APPENDIX C

SHEET 4 of 14



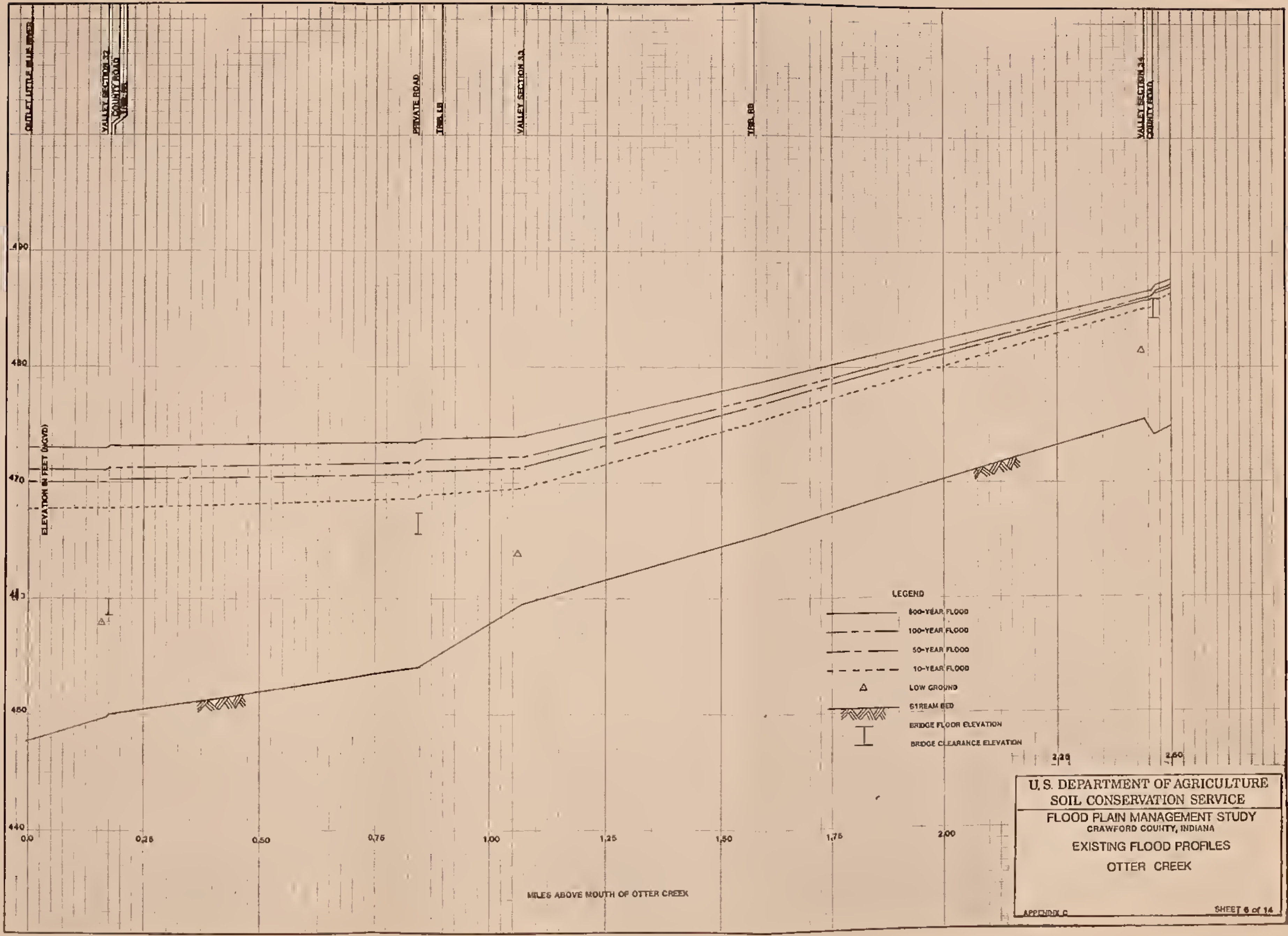
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA

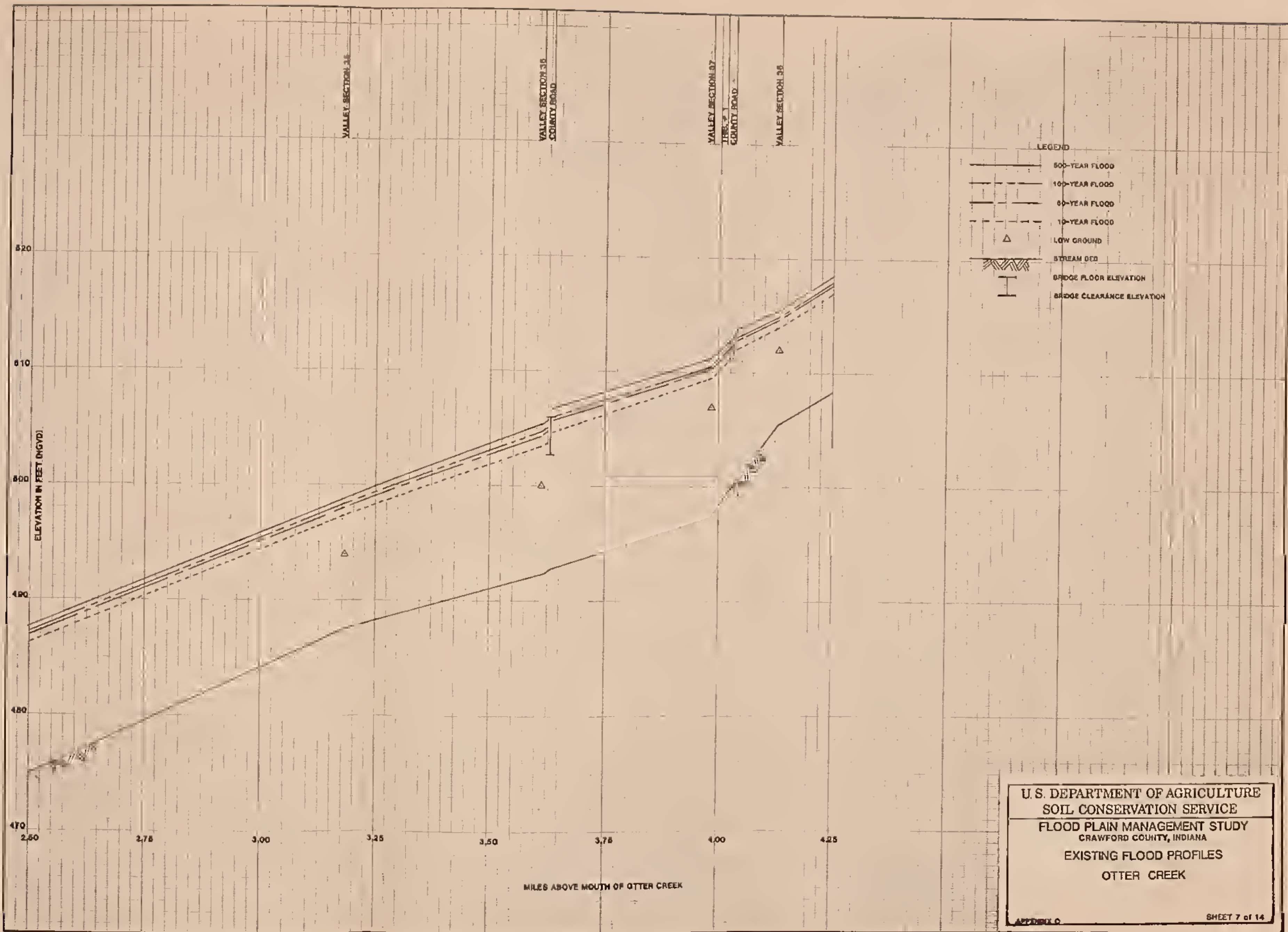
EXISTING FLOOD PROFILES
POTTS CREEK

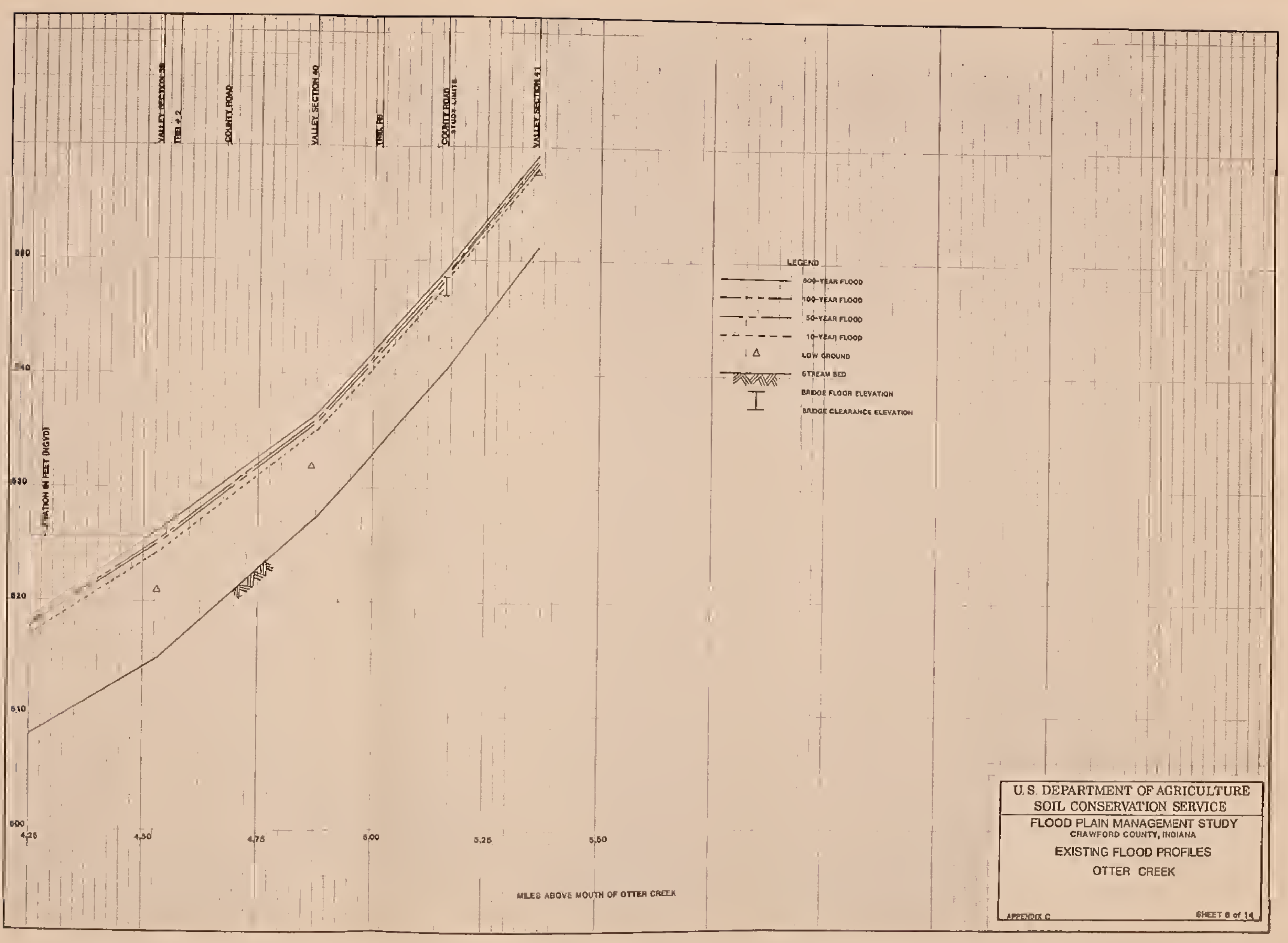
APPENDIX C

SHEET 6 of 14



OUTLET LITTLE BLUE RIVER
VALLEY SECTION 32
COUNTY ROAD
PRIVATE ROAD
VALLEY SECTION 33
TRIB. RB
VALLEY SECTION 34
COUNTY ROAD
ELEVATION IN FEET (NGVD)
490
480
470
450
440
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
LOW GROUND
STREAM BED
BRIDGE FLOOR ELEVATION
BRIDGE CLEARANCE ELEVATION
0.0
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
2.50
MILES ABOVE MOUTH OF OTTER CREEK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA
EXISTING FLOOD PROFILES
OTTER CREEK
APPENDIX C
SHEET 6 of 14


VALLEY SECTION 35
VALLEY SECTION 36
COUNTY ROAD
VALLEY SECTION 37
COUNTY ROAD
VALLEY SECTION 38
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
LOW GROUND
STREAM BED
BRIDGE FLOOR ELEVATION
BRIDGE CLEARANCE ELEVATION
ELEVATION IN FEET (NGVD)
520
510
500
490
480
470
2.50
2.75
3.00
3.25
3.50
3.75
4.00
4.25
MILES ABOVE MOUTH OF OTTER CREEK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA
EXISTING FLOOD PROFILES
OTTER CREEK
APPENDIX C
SHEET 7 of 14



U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

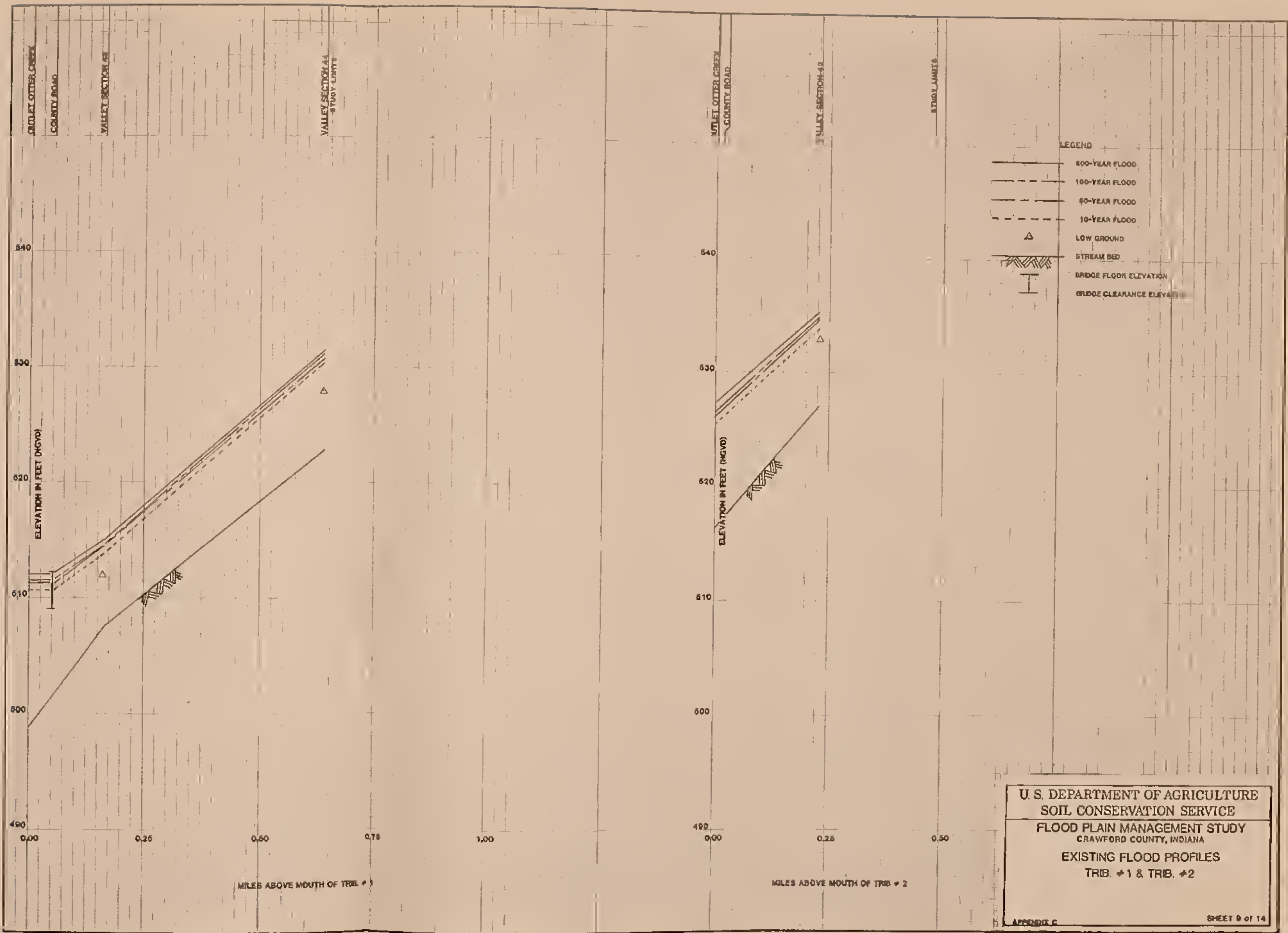
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA

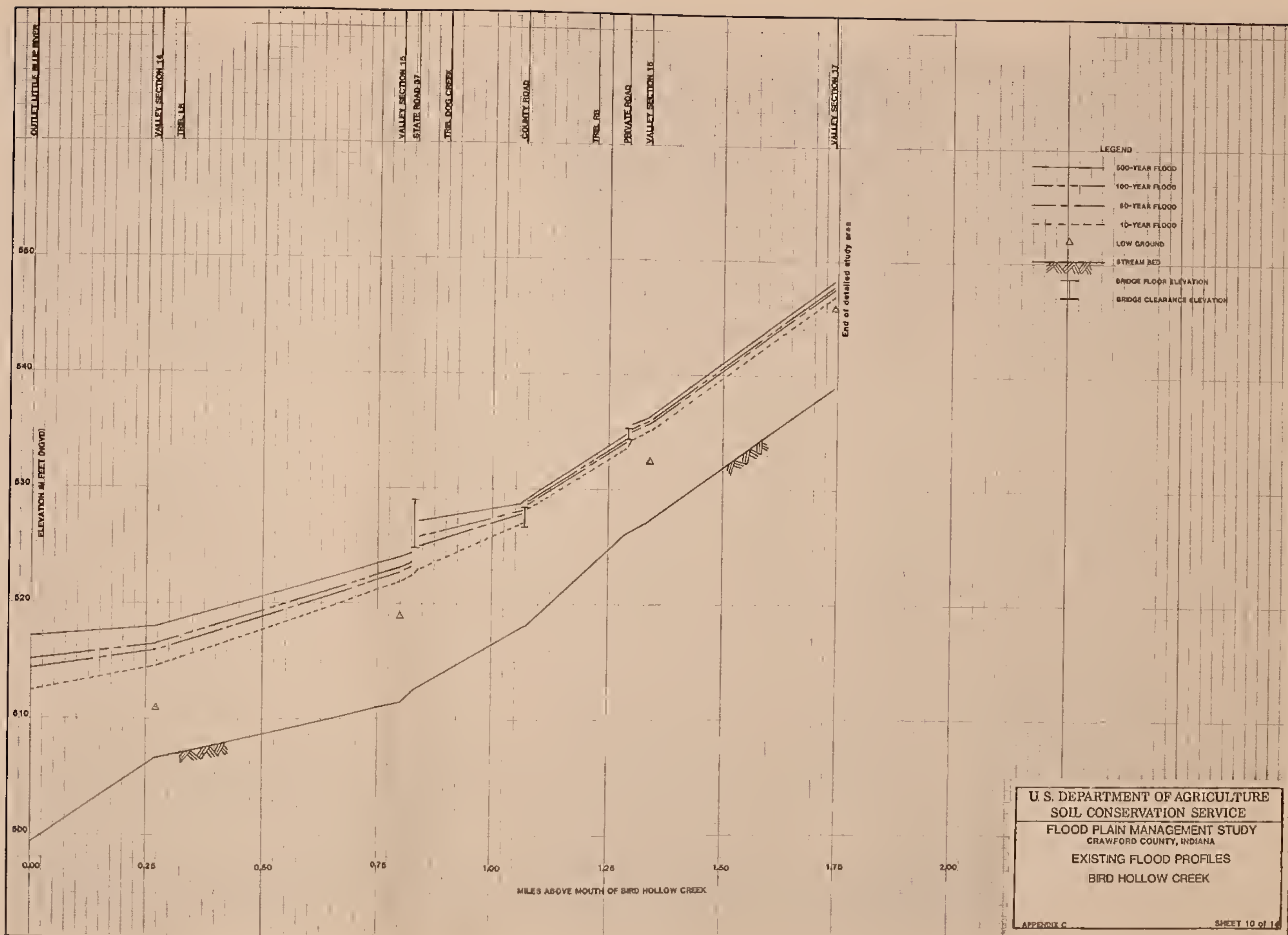
EXISTING FLOOD PROFILES

OTTER CREEK

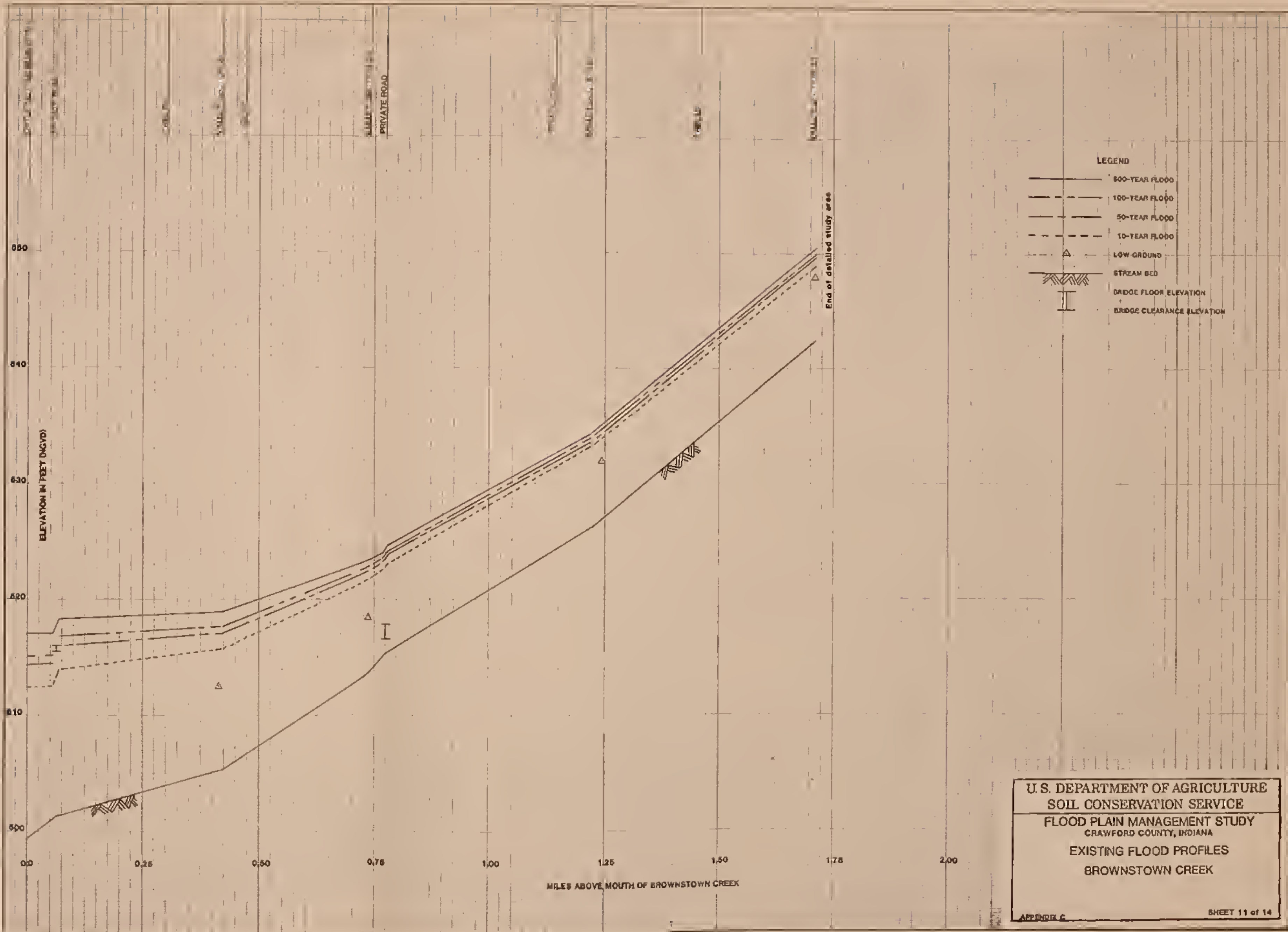
APPENDIX C

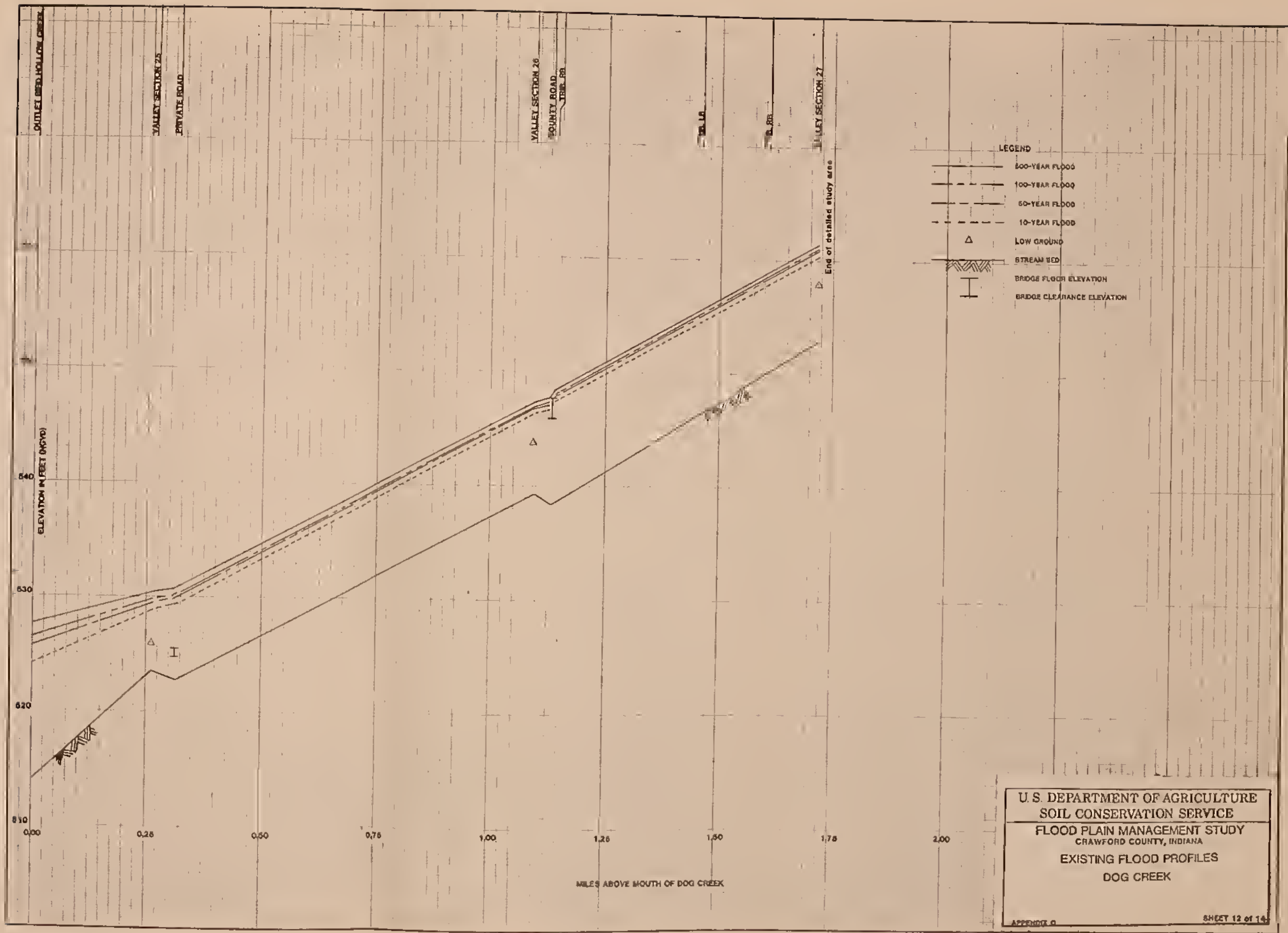
SHEET 8 of 14

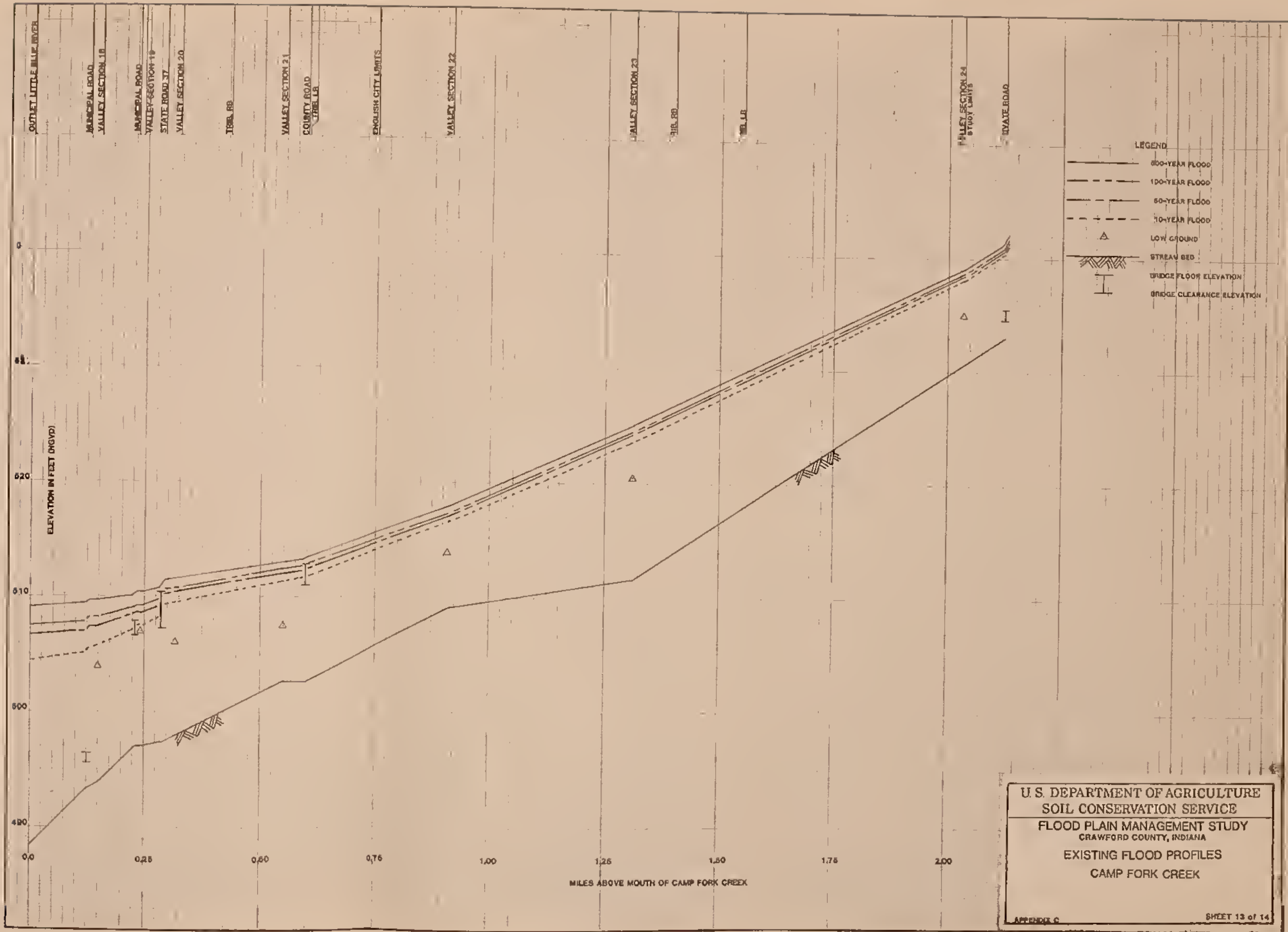

OUTLET OTTER CREEK
COUNTY ROAD
VALLEY SECTION 45
VALLEY SECTION 44
STUDY LIMITS
ELEVATION IN FEET (NGVD)
540
530
520
510
500
490
0.00
0.25
0.50
0.75
1.00
MILES ABOVE MOUTH OF TRIB. # 1
OUTLET OTTER CREEK
COUNTY ROAD
VALLEY SECTION 43
STUDY LIMITS
MILES ABOVE MOUTH OF TRIB. # 2
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
LOW GROUND
STREAM BED
BRIDGE FLOOR ELEVATION
BRIDGE CLEARANCE ELEVATION
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA
EXISTING FLOOD PROFILES
TRIB. #1 & TRIB. #2
APPENDIX C
SHEET 9 of 14



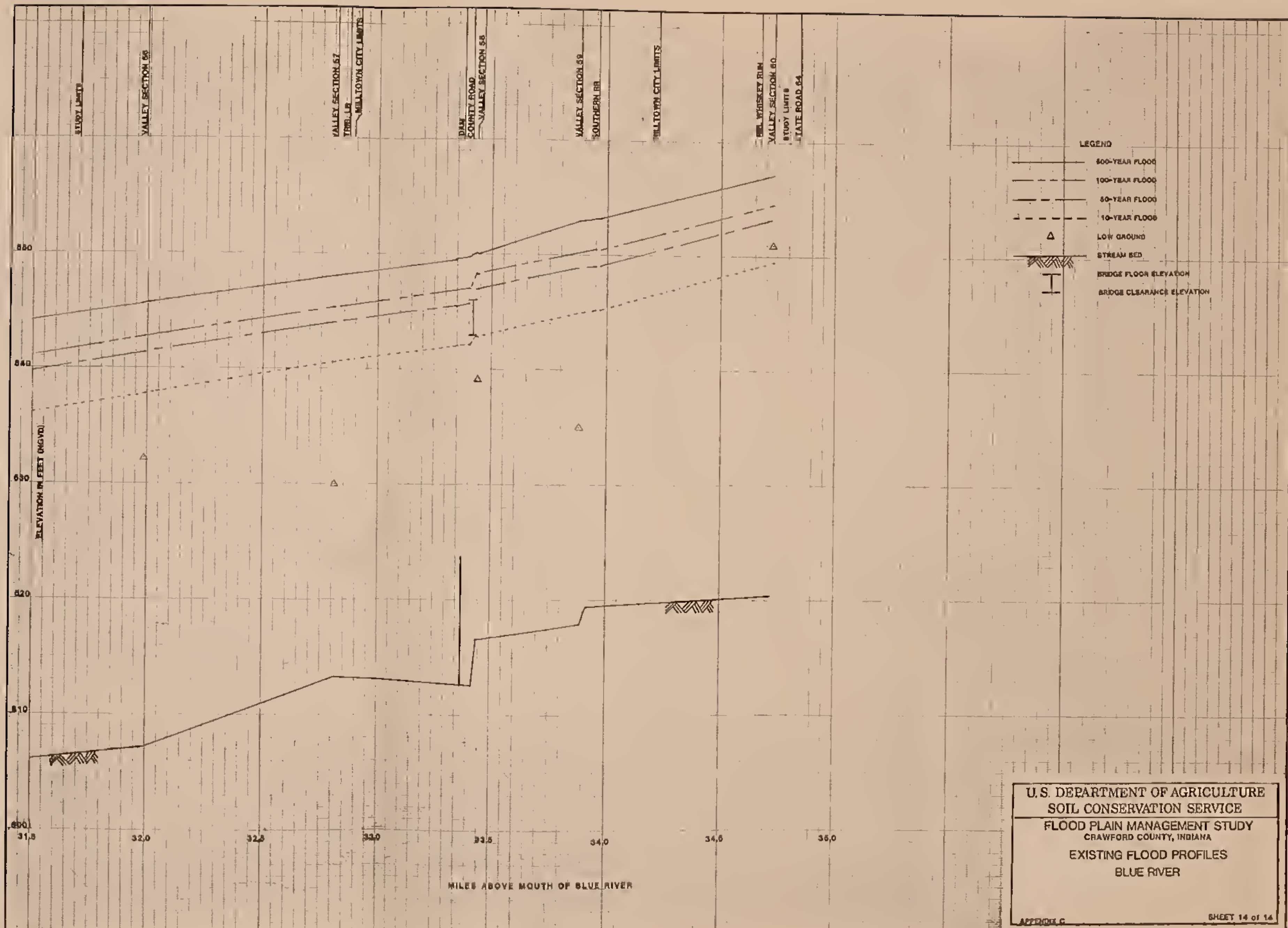
OUTLET LITTLE BLUE RIVER
VALLEY SECTION 14
VALLEY SECTION 15
STATE ROAD 37
TRIB. DOG CREEK
COUNTY ROAD
PRIVATE ROAD
VALLEY SECTION 16
VALLEY SECTION 17
End of detailed study area
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
LOW GROUND
STREAM BED
BRIDGE FLOOR ELEVATION
BRIDGE CLEARANCE ELEVATION
ELEVATION IN FEET (NGVD)
550
540
530
520
510
500
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
MILES ABOVE MOUTH OF BIRD HOLLOW CREEK
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA
EXISTING FLOOD PROFILES
BIRD HOLLOW CREEK
APPENDIX C
SHEET 10 of 14


PRIVATE ROAD
End of detailed study area
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
LOW GROUND
STREAM BED
BRIDGE FLOOR ELEVATION
BRIDGE CLEARANCE ELEVATION
ELEVATION IN FEET (NGVD)
650
640
630
620
610
600
0.0
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
MILES ABOVE MOUTH OF BROWNSTOWN CREEK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA
EXISTING FLOOD PROFILES
BROWNSTOWN CREEK
APPENDIX C
SHEET 11 of 14


VALLEY SECTION 25
PRIVATE ROAD
VALLEY SECTION 26
COUNTY ROAD
VALLEY SECTION 27
End of detailed study area
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
LOW GROUND
STREAM BED
BRIDGE FLOOR ELEVATION
BRIDGE CLEARANCE ELEVATION
ELEVATION IN FEET (NGVD)
540
530
520
510
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
MILES ABOVE MOUTH OF DOG CREEK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA
EXISTING FLOOD PROFILES
DOG CREEK
SHEET 12 of 14

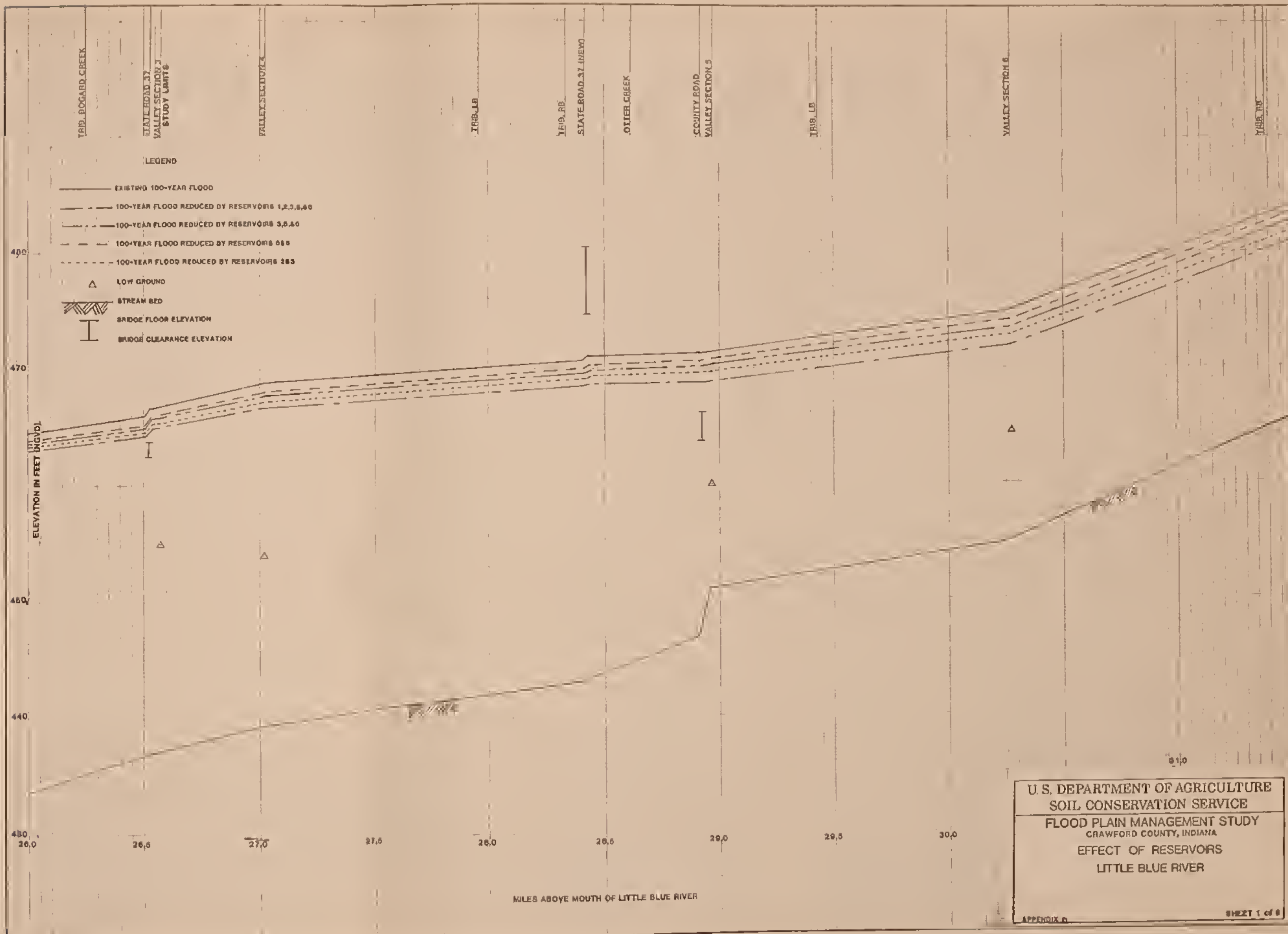


OUTLET LITTLE BLUE RIVER
MUNICIPAL ROAD
VALLEY SECTION 18
MUNICIPAL ROAD
VALLEY SECTION 19
STATE ROAD 37
VALLEY SECTION 20
TRIB. RB
VALLEY SECTION 21
COUNTY ROAD
TRIB. LB
ENGLISH CITY LIMITS
VALLEY SECTION 22
VALLEY SECTION 23
TRIB. RB
TRIB. LB
VALLEY SECTION 24
STUDY LIMITS
PRIVATE ROAD
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
LOW GROUND
STREAM BED
BRIDGE FLOOR ELEVATION
BRIDGE CLEARANCE ELEVATION
ELEVATION IN FEET (NGVD)
620
610
600
590
0.0
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
MILES ABOVE MOUTH OF CAMP FORK CREEK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA
EXISTING FLOOD PROFILES
CAMP FORK CREEK
APPENDIX C
SHEET 13 of 14


STUDY LIMITS
VALLEY SECTION 56
VALLEY SECTION 57
MILLTOWN CITY LIMITS
DAM
COUNTY ROAD
VALLEY SECTION 58
VALLEY SECTION 59
SOUTHERN RR
MILLTOWN CITY LIMITS
WHISKEY RUN
VALLEY SECTION 60
STUDY LIMITS
STATE ROAD 64
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
LOW GROUND
STREAM BED
BRIDGE FLOOR ELEVATION
BRIDGE CLEARANCE ELEVATION
ELEVATION IN FEET (NGVD)
650
640
630
620
610
600
31.5
32.0
32.5
33.0
33.5
34.0
34.5
35.0
MILES ABOVE MOUTH OF BLUE RIVER
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA
EXISTING FLOOD PROFILES
BLUE RIVER
APPENDIX C
SHEET 14 of 14

APPENDIX D

Effects of Reservoirs, Profiles



U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

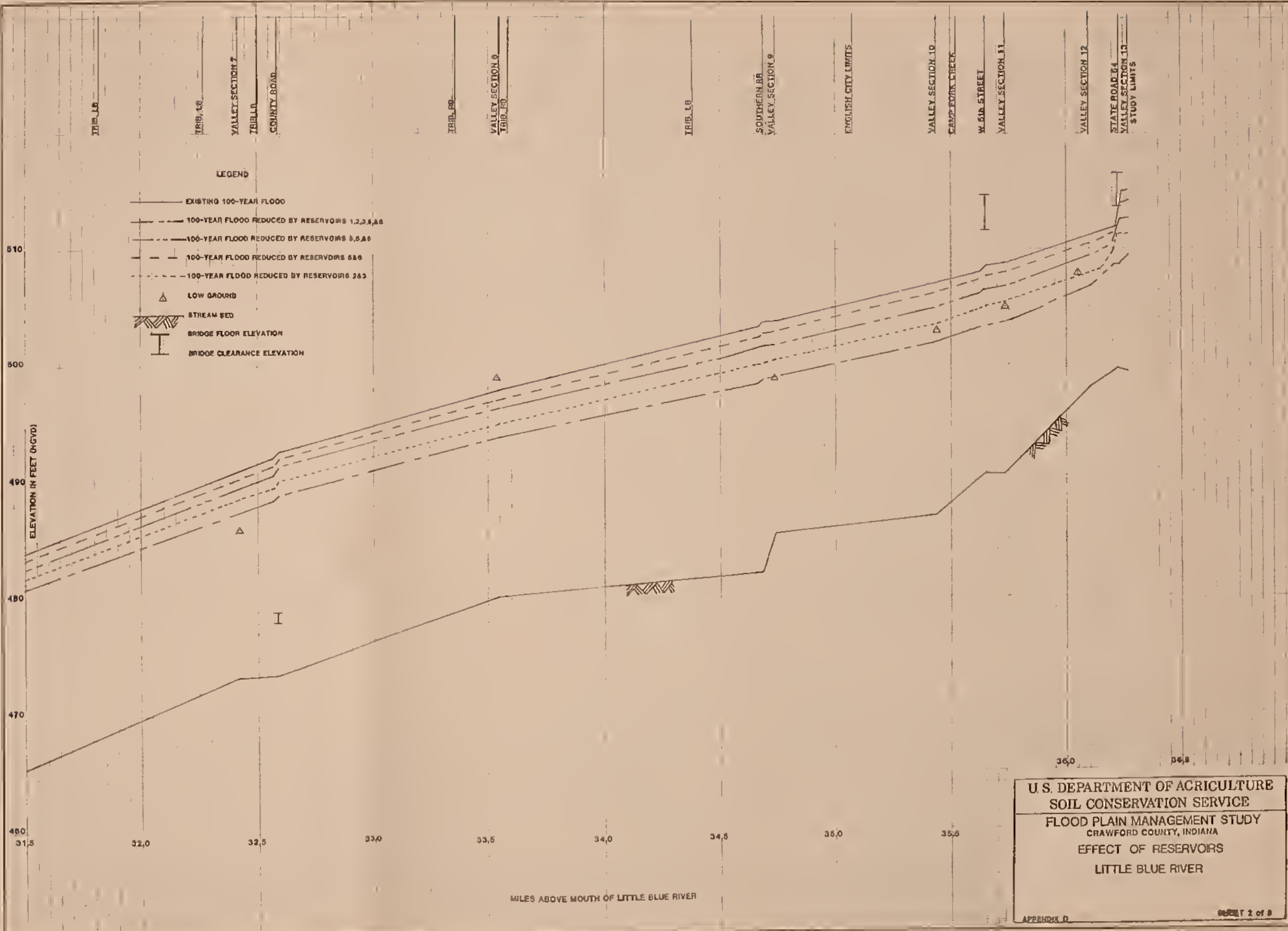
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA

EFFECT OF RESERVOIRS

LITTLE BLUE RIVER

APPENDIX D

SHEET 1 of 6



U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

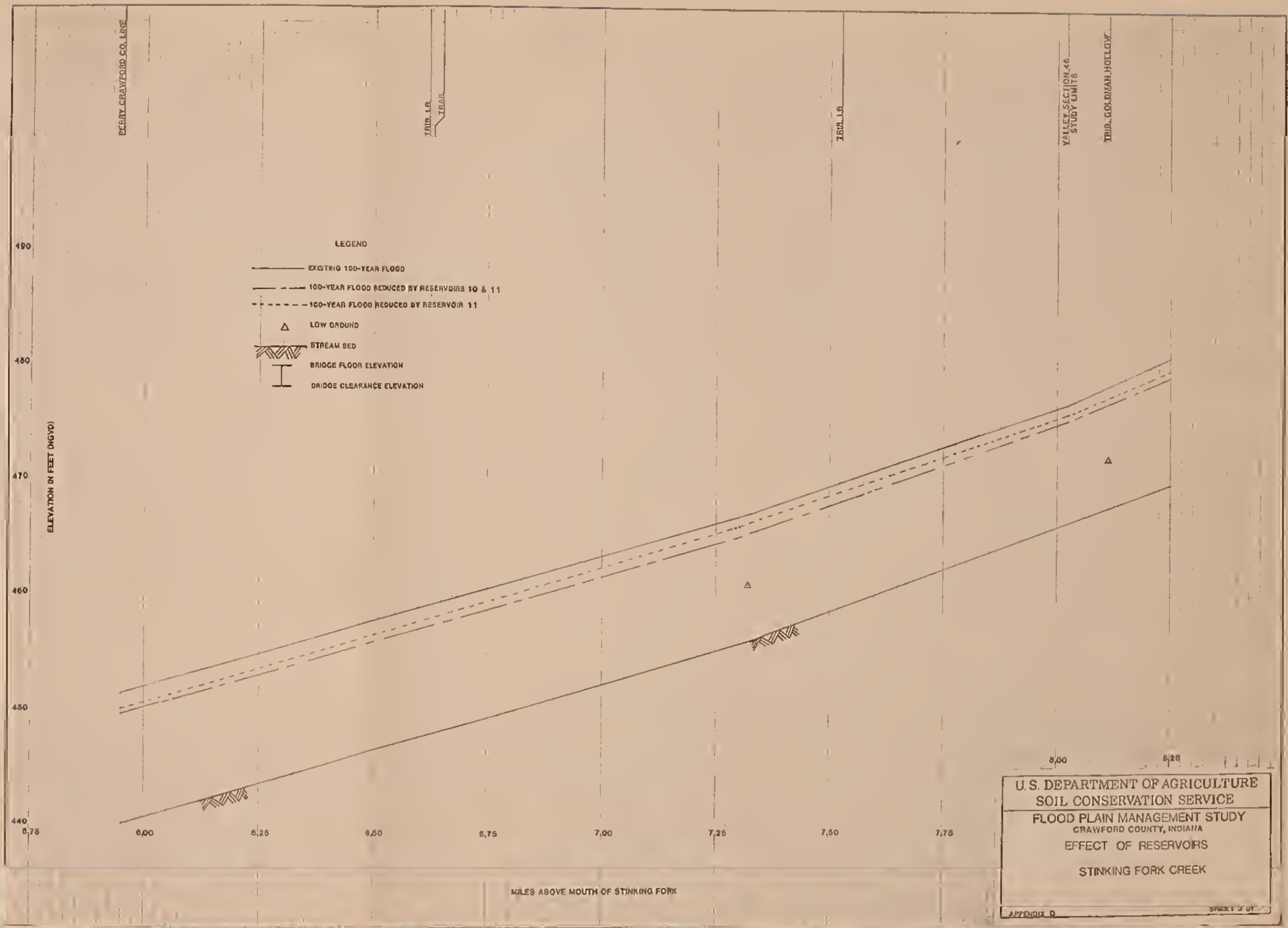
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA

EFFECT OF RESERVOIRS

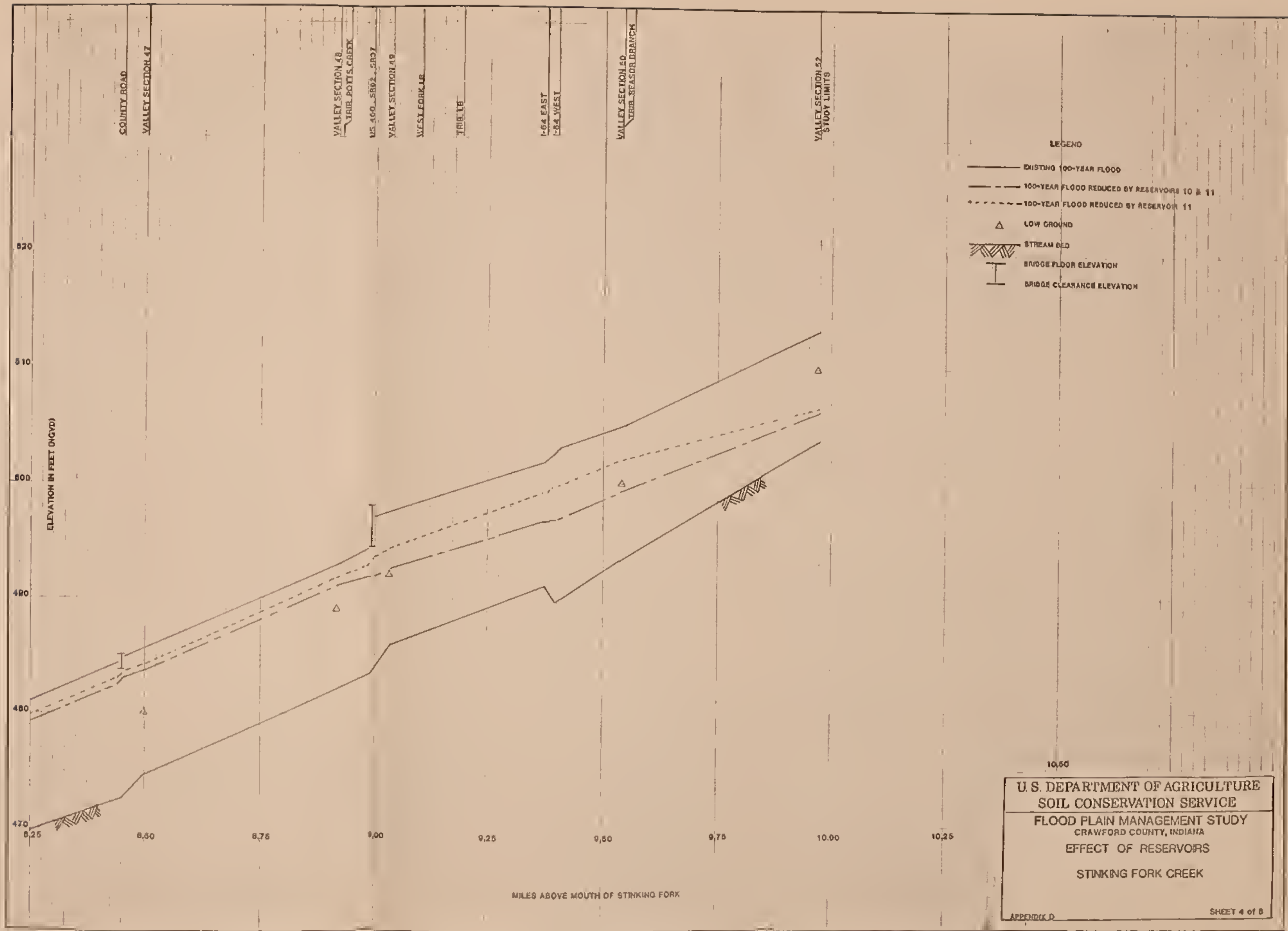
LITTLE BLUE RIVER

APPENDIX D

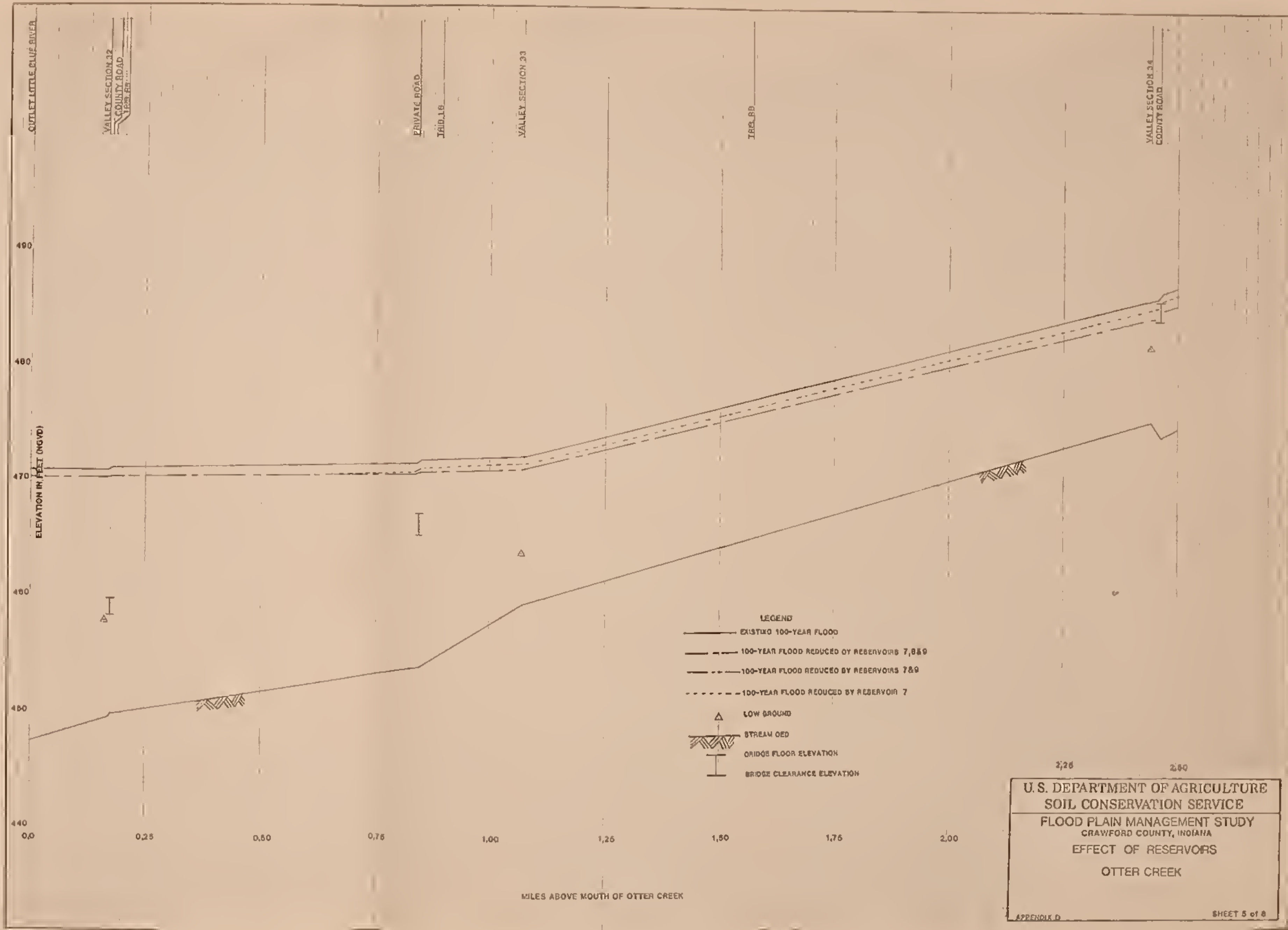
SHEET 2 of 8

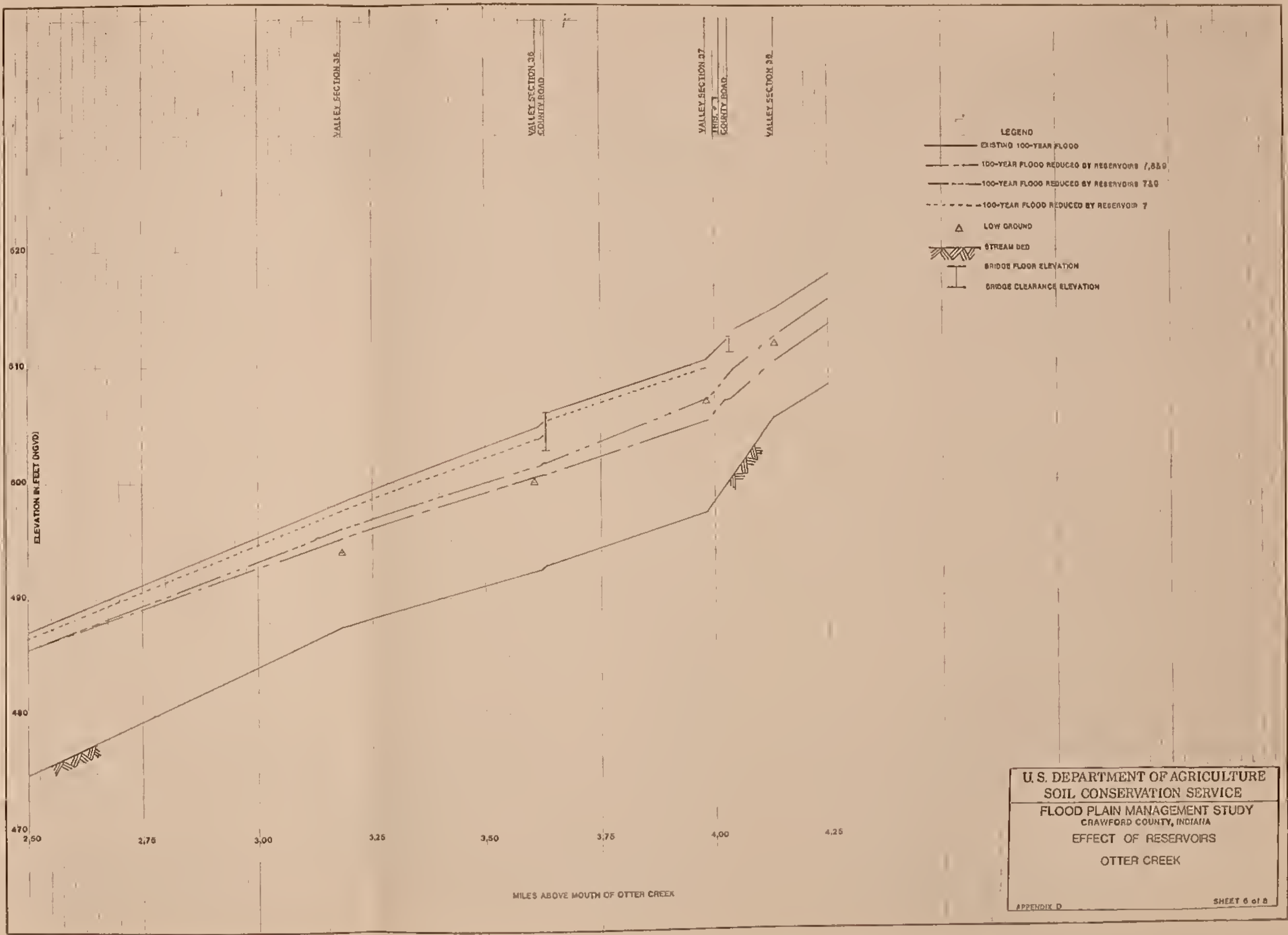


PERRY-CRAWFORD CO. LINE
TRIB. 18
TRIB. 18
VALLEY SECTION 46
STUDY LIMITS
TRIB. GOLDMAN HOLLOW
LEGEND
EXISTING 100-YEAR FLOOD
100-YEAR FLOOD REDUCED BY RESERVOIRS 10 & 11
100-YEAR FLOOD REDUCED BY RESERVOIR 11
LOW GROUND
STREAM BED
BRIDGE FLOOR ELEVATION
BRIDGE CLEARANCE ELEVATION
ELEVATION IN FEET (NGVD)
490
480
470
460
450
440
5.75
6.00
6.25
6.50
6.75
7.00
7.25
7.50
7.75
8.00
8.25
MILES ABOVE MOUTH OF STINKING FORK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA
EFFECT OF RESERVOIRS
STINKING FORK CREEK
APPENDIX D



COUNTY ROAD
VALLEY SECTION 47
VALLEY SECTION 48
TRIB. POTTS CREEK
US 460 SR62 SR37
VALLEY SECTION 49
WEST FORK LB
TRIB LB
I-64 EAST
I-64 WEST
VALLEY SECTION 50
TRIB. SEASOR BRANCH
VALLEY SECTION 52
STUDY LIMITS
LEGEND
EXISTING 100-YEAR FLOOD
100-YEAR FLOOD REDUCED BY RESERVOIRS 10 & 11
100-YEAR FLOOD REDUCED BY RESERVOIR 11
LOW GROUND
STREAM BED
BRIDGE FLOOR ELEVATION
BRIDGE CLEARANCE ELEVATION
ELEVATION IN FEET (NGVD)
520
510
500
490
480
470
8.25
8.50
8.75
9.00
9.25
9.50
9.75
10.00
10.25
10.50
MILES ABOVE MOUTH OF STINKING FORK
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA
EFFECT OF RESERVOIRS
STINKING FORK CREEK
APPENDIX D
SHEET 4 of 8


OUTLET LITTLE BLUE RIVER
VALLEY SECTION 32
COUNTY ROAD
PRIVATE ROAD
VALLEY SECTION 33
VALLEY SECTION 34
COUNTY ROAD
ELEVATION IN FEET (NGVD)
490
480
470
460
450
440
0.0
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
2.50
MILES ABOVE MOUTH OF OTTER CREEK
LEGEND
EXISTING 100-YEAR FLOOD
100-YEAR FLOOD REDUCED BY RESERVOIRS 7,8&9
100-YEAR FLOOD REDUCED BY RESERVOIRS 7&9
100-YEAR FLOOD REDUCED BY RESERVOIR 7
LOW GROUND
STREAM BED
BRIDGE FLOOR ELEVATION
BRIDGE CLEARANCE ELEVATION
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA
EFFECT OF RESERVOIRS
OTTER CREEK
APPENDIX D
SHEET 5 of 8



U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

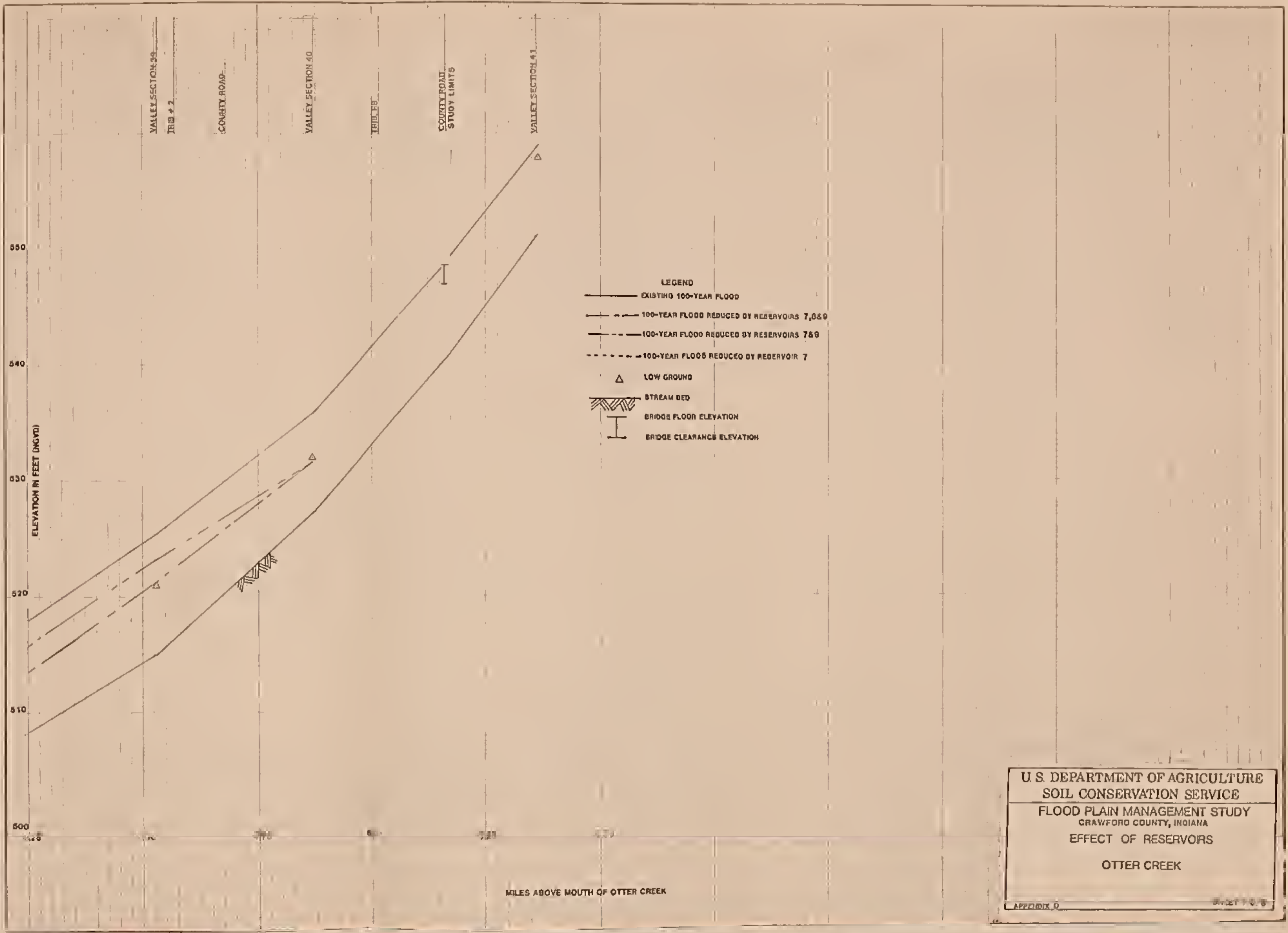
FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA

EFFECT OF RESERVOIRS

OTTER CREEK

APPENDIX D

SHEET 6 of 8



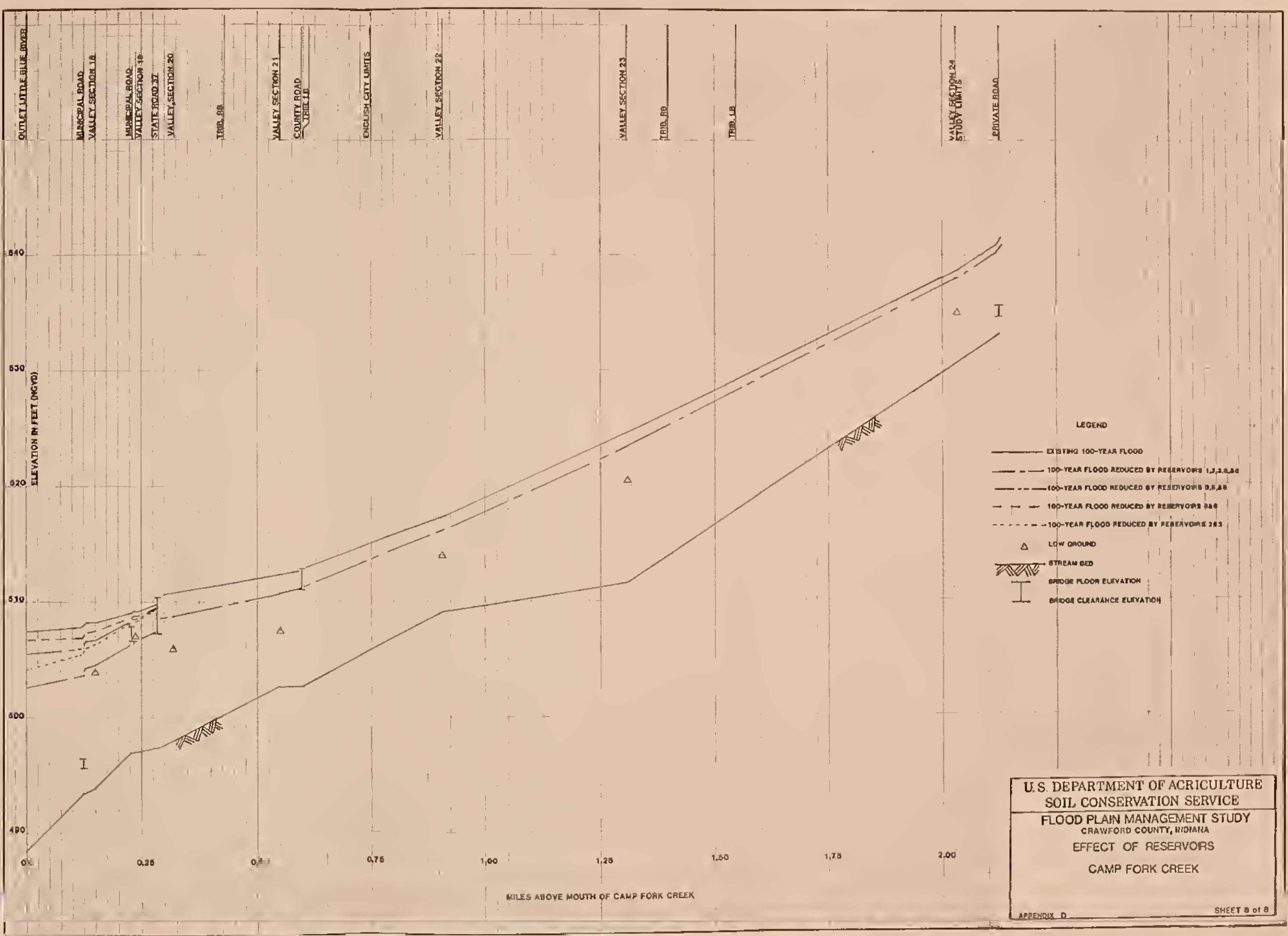
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA

EFFECT OF RESERVOIRS

OTTER CREEK

APPENDIX D



U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAIN MANAGEMENT STUDY
CRAWFORD COUNTY, INDIANA

EFFECT OF RESERVOIRS

CAMP FORK CREEK

APPENDIX D

SHEET 8 of 8

APPENDIX E

Structures Cost Table

APPENDIX E

ESTIMATED DAM COSTS*

STRUCTURE NUMBER	COSTRUCTION COST $	LAND RIGHTS COST $	TOTAL COST $
1	$ 369,000	$ 112,000	$ 481,000
2	$ 549,000	$ 580,000	$1,129,000
3	$ 459,000	$ 252,000	$ 711,000
4	$ 486,000	$ 964,000	$1,450,000
5	$ 240,000	$ 120,000	$ 360,000
6	$ 177,000	$ 50,000	$ 227,000
7	$ 315,000	$ 220,000	$ 535,000
8	$ 210,000	$ 90,000	$ 300,000
9	$ 498,000	$ 212,000	$ 710,000
10	$ 129,000	$ 100,000	$ 229,000
11	$ 414,000	$ 420,000	$ 834,000

*The estimated dam costs shown are based on approximate quanitities using 1983 cost data. Actual structure cost may vary substantially with a more detailed analysis.

APPENDIX F

Discharge-Elevation Tables

CRAWFORD COUNTY F.P.M.S.
100-year Elevation - Discharge

Stream and Valley Section Number	Present Condition			Maintained Channel 1/			With Structures 1,2,3,5 & 6			With Structures 3, 5 & 6			With Structures 2 & 3			With Structures 5 & 6		
	Elevation Feet	Discharge CFS	Acres Flooded	Elevation Feet	Discharge CFS	Acres Flooded	Elevation Feet	Discharge CFS	Acres Flooded	Elevation Feet	Discharge CFS	Acres Flooded	Elevation Feet	Discharge CFS	Acres Flooded	Elevation Feet	Discharge CFS	Acres Flooded
LITTLE BLUE R.																		
VS-3	466.8	16,510		466.8	16,510		465.0	12,030		465.8	14,180		465.4	13,180		466.1	15,060	
VS-4	468.9	16,490	25	468.9	16,490	25	466.7	11,990		467.7	14,160	23	467.2	13,150	22	468.1	15,040	24
VS-5	471.4	13,150	183	471.4	13,150	183	468.9	7,600	117	470.3	10,520	171	469.7	9,100	164	470.7	11,870	178
VS-6	474.8	13,000	142	474.8	13,000	142	471.9	7,430	115	473.5	10,370	141	472.8	8,940	138	474.1	11,730	142
VS-7	491.0	12,500	114	489.7	12,500	92	487.4	6,860	33	489.5	9,840	87	488.6	8,380	63	490.3	11,260	105
VS-8	497.9	12,340	10	496.2	12,340	5	493.8	6,680		496.2	9,670	5	495.0	8,200	3	497.1	11,100	7
VS-9	503.8	11,930	13	501.8	11,930	10	498.7	6,250		501.7	9,260	9	500.4	7,770	4	502.9	10,720	12
VS-10	507.1	11,860	25	505.0	11,860	15	501.9	6,170		504.9	9,190	13	503.5	7,690	2	506.2	10,650	21
VS-11	508.8	9,540	30	507.2	9,540	24	503.7	3,980		506.8	6,910	19	505.4	5,400		508.0	8,490	27
VS-12	511.1	9,520	28	509.8	9,520	26	506.8	3,960		509.4	6,880	24	508.3	5,380	11	510.4	8,460	27
VS-13	515.1	9,500	22	514.5	9,500	22	509.5	3,940	2	512.7	6,870	21	511.3	5,360	12	514.2	8,440	22
BIRD HOLLOW CK.																		
VS-14	516.5	6,580	17	516.1	6,580	17	511.6	1,100		514.5	3,800	12	512.3	1,100		516.1	6,580	17
VS-15	523.1	6,380	35	523.1	6,380	35	517.3	750		521.5	3,800	21	517.4	750		523.0	6,380	35
VS-16	535.9	2,880	13	535.9	2,880	13	530.7	250		530.8	250		530.7	250		535.9	2,880	13
VS-17	547.7	2,740	32	547.7	2,740	32	538.9	0								547.7	2,740	32
CAMP FORK CK.																		
VS-18	508.2	6,580		506.6	6,580		504.5	3,840		506.7	6,580		506.3	6,580		507.5	6,580	
VS-19	509.2	6,550		508.3	6,550		506.5	3,820		508.5	6,550		508.4	6,550		508.8	6,550	
VS-20	510.7	6,380	6	510.6	6,380	6	508.7	3,720	3	510.6	6,380	6	510.6	6,380	6	510.6	6,380	6
VS-21	512.4	6,300	15	512.3	6,300	15	510.7	3,675	13	512.3	6,300	15	512.3	6,300	15	512.3	6,300	15
VS-22	517.3	5,940	22	517.3	5,940	22	516.2	3,460	17	517.3	5,940	22	517.3	5,940	22	517.3	5,940	22
VS-23	524.5	5,720	21	524.5	5,720	21	523.4	3,330	16	524.5	5,720	21	524.5	5,720	21	524.5	5,720	21
VS-24	538.7	5,158	77	538.7	5,158	77	538.0	3,320	69	538.7	5,158	77	538.7	5,158	77	538.7	5,158	77
BROWNSTOWN CK.																		
VS-28	517.6	4,900	15	517.4	4,900	15	514.7	2,500	6	515.1	2,500	6	516.9	4,900	15	515.7	2,500	6
VS-29	522.7	3,850	23	522.7	3,850	23	521.3	2,400	17	521.4	2,400	17	522.6	3,850	23	521.3	2,400	17
VS-30	533.9	3,690	17	533.9	3,690	17	532.9	2,400	12	532.9	2,400	12	533.9	3,690	17	532.9	2,400	12
VS-31	549.9	3,440	37	549.9	3,440	37	549.0	2,400	27	549.0	2,400	27	549.9	3,440	37	549.0	2,400	27
DOG CK.																		
VS-25	529.8	4,420	26	529.8	4,420	26	525.6	120	-	529.4	4,410	26	525.6	120	-	529.9	4,410	26
VS-26	546.8	4,070	42	546.8	4,070	42	539.2	0	-	546.8	4,070	42	-	-	-	546.9	4,070	42
VS-27	561.0	3,010	62	561.0	3,010	62	-	-	-	561.0	3,010	62	-	-	-	561.0	3,010	62

1/ Maintained Channel - Vegetation and gravel bars kept out of the 3.4 miles of Little Blue River Flood Prevention Channel Constructed in 1964

CRAWFORD COUNTY F.P.M.S.
100-Year Elevation - Discharge

Stream and Valley Section Number	Present Condition Elevation Feet	Present Condition Discharge CFS	Acres Flooded	With Structures 7,8&9 Elevation Feet	With Structures 7,8&9 Discharge CFS	Acres Flooded	With Structure 7 Elevation Feet	With Structure 7 Discharge CFS	Acres Flooded	With Structures 7 & 9 Elevation Feet	With Structures 7 & 9 Discharge CFS	Acres Flooded
OTTER CREEK												
VS-32	471.1	10,020	-	470.4	7,000	-	470.4	9,000	-	470.4	7,500	-
VS-33	472.2	9,870	66	471.2	7,000	62	471.6	9,000	65	471.3	7,500	63
VS-34	486.0	7,790	141	484.5	3,500	69	485.3	6,000	134	484.6	4,000	97
VS-35	498.4	6,770	41	495.2	1,700	-	497.6	5,000	39	495.9	2,300	-
VS-36	504.7	6,680	15	500.4	1,700	-	503.7	5,000	14	501.4	2,300	-
VS-37	510.5	6,430	22	505.3	1,200	-	509.8	5,000	22	507.2	2,100	-
VS-38	514.9	4,480	9	510.5	900	-	515.0	5,000	9	512.6	2,000	-
VS-39	525.3	4,420	11	521.4	900	-	525.7	5,000	14	523.2	2,000	4
VS-40	535.8	3,040	21	531.5	300	-	535.9	3,000	20	531.5	300	-
VS-41	558.7	1,790		551.1	0	-	-	-	-	-	-	-
TRIB #1												
VS-43	514.4	3,070	-	509.7	200	-	510.7	200	-	509.9	200	-
VS-44	531.2	2,650	12	-	-	-	-	-	-	-	-	-
TRIB #2												
VS-42	534.8	1,840	-	529.9	200	-	-	-	-	-	-	-

Stream and Valley Section Number	Present Condition Elevation Feet	Present Condition Discharge CFS	Acres Flooded	With Structures 10&11 Elevation Feet	With Structures 10&11 Discharge CFS	Acres Flooded	With Structure 11 Elevation Feet	With Structure 11 Discharge CFS	Acres Flooded
STINKING FORK									
VS-45	467.1	9,350	-	465.5	5,400	-	466.0	6,300	
VS-46	476.8	9,020	-	475.3	5,400	-	475.9	6,300	
VS-47	485.5	8,080	25	483.6	3,800	11	484.2	5,000	22
VS-48	492.8	7,970	25	491.0	3,800	9	491.7	5,000	19
VS-49	497.5	6,170	11	492.5	1,000	-	494.2	2,500	-
VS-50	505.0	5,880	26	499.3	800	-	502.0	2,300	-
VS-52	513.4	4,800	17	506.2	200	-	506.5	200	-
REASOR BRANCH									
VS-51	519.6	1,660	-	516.3	150	-	519.6	1,660	-
POTTS CREEK									
VS-53	498.2	3,090	4	498.0	3,090	4	-	-	4
VS-54	522.6	2,700	22	522.6	2,700	22	-		22
BLUE RIVER				NO STRUCTURES					
VS-56	542.7	29,050	22						
VS-57	545.3	29,030	30						
DAM	546.8	28,960	--						
VS-58	548.2	28,960	48						
VS-59	550.2	28,950	36						
VS-60	554.5	26,600	55						